

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

Some Problems Involved in Establishing Milk Prices

Issued September 1937



UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Adjustment Administration

Division of Marketing and Marketing Agreements - Dairy Section

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Adjustment Administration
Division of Marketing and Marketing Agreements - Dairy Section



Some Problems Involved in Establishing Milk Prices

By
E. W. Gaumnitz
Chief, Dairy Section
and
O. M. Reed
*Senior Agricultural Economist
Dairy Section*

Issued September 1937



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1937



CONTENTS

	Page
Introduction.....	1
CHAPTER 1. The dairy industry in the United States.....	3
I. Farm production.....	3
II. Disposal of milk produced on farms.....	8
III. Utilization of milk.....	11
IV. Production of major manufactured dairy products.....	11
V. Prices.....	13
VI. Income from milk produced on farms.....	18
CHAPTER 2. Some facts and considerations concerning the structure of milk markets.....	20
I. Historical sketch of the development of fluid-milk-marketing co- operatives—large-scale organization of the supply.....	20
II. Development of the classified-price plan of selling milk to dis- tributors.....	27
III. Methods of prorating among producers the proceeds of sales to distributors.....	32
The individual-distributor pool without rating.....	32
The market-wide or straight pool without rating.....	33
The market-wide or straight pool with rating.....	35
Historical sketch of the development of the rating plan.....	36
IV. Size of business of individual distributors.....	40
V. Summary.....	41
CHAPTER 3. Some facts and considerations regarding the demand for milk and the seasonal course of supplies in selected milk markets.....	42
I. The nature of the demand for milk.....	42
Consumers' response to changes in the price of milk.....	42
Seasonal variation in the demand for milk.....	45
Daily variation in the demand for milk.....	46
II. Variations in production.....	47
III. The seasonal excess.....	53
IV. The daily excess.....	55
V. Summary.....	55
CHAPTER 4. The general theory of milk prices.....	56
I. The general theory of milk prices in simple markets.....	56
The milk-price structure: Uniform quality—centralized proc- essing—no variation in demand or supply.....	58
The milk-price structure: Uniform quality—decentralized processing.....	59
The milk-price structure: Varying quality requirements— decentralized processing.....	61
The milk-price structure: Decentralized processing—uniform quality—variations in production.....	62
II. The price structure of the milk market following changes in the market situation.....	67
Changes in transportation costs.....	68
Changes in supply.....	70
Changes in demand.....	72
The adjustment period.....	73
Application of the formulae.....	74
III. The general theory of milk prices in markets where distributors are large, products are differentiated, and producers are small and unorganized.....	75
Size of business of milk distributors and product differentia- tion in the milk trade.....	75
The nature of the equilibrium adjustment under conditions of complex competition.....	79
The allocation of milk among enterprises.....	88

CHAPTER 4.—The general theory of milk prices—Continued.

III. The general theory of milk prices in markets where distributors are large, products are differentiated, and producers are small and unorganized—Continued.	Page
The operating reserve.....	89
The seasonal excess.....	91
The effect of organization of the supply upon seasonal inter-enterprise diversion.....	92
Annual interenterprise diversion.....	96
The price structure for milk—the effect of seasonal variation in production—uniform quality requirements.....	96
The effect of seasonal variation in production upon the price structure for milk—varying quality requirements.....	100
IV. The general theory of milk prices under conditions of complex competition in both milk production and milk distribution.....	103
V. Summary.....	106
CHAPTER 5. Some problems in pricing milk f. o. b. the city.....	108
I. Introductory.....	108
II. Some factors affecting the price of milk f. o. b. the city, under assumptions of simple competition in the sale of milk to distributors.....	108
III. The effect of organization of the supply—additional factors to be considered in the problem of milk-price determination.....	111
IV. Some criteria of whether prices are proper.....	114
V. Arbitrary milk prices.....	115
VI. Factors affecting the number of classes: The volume of milk production within the milkshed in relation to sales.....	121
VII. Factors affecting the number of classes: The influence of sanitation regulations.....	122
VIII. Factors affecting the number of classes: The influence of differences in transportation costs per unit of milk and the product equivalent of such unit.....	123
IX. Factors affecting the number of classes: Commodity price discrimination.....	123
X. Factors affecting the size of the price differential between classes.....	126
XI. Summary.....	127
CHAPTER 6. Some problems in pooling milk.....	128
I. Introductory.....	128
II. The influence of seasonal variation in class prices upon the seasonal variation in prices f. o. b. the market and in prices received by individual producers.....	131
III. Some effects of the individual-distributor pool upon prices received by producers.....	133
IV. Some effects of the market-wide pool without rating upon prices received by producers.....	138
V. Some effects of the market-wide pool with rating upon prices received by producers.....	139
VI. Producers' response to price.....	144
VII. Summary.....	156
CHAPTER 7. Some problems of public policy in regard to the milk trade.....	158
I. Introductory.....	158
II. Suggestion for improving conditions in the milk trade.....	161
Reorganization of the market structure so that prices would be determined under conditions of simple competition.....	161
Discontinuation of Government interference in milk trade, with special reference to prices.....	165
The labor problem.....	172
Possible accomplishments of present regulatory measures in improving conditions in the milk trade.....	177
Further centralization of the milk-distributing business.....	178

APPENDIXES

Appendix A—Tabular data.....	192
Appendix B—Typical membership contracts of cooperative milk producers' associations.....	215
Appendix C—Extracts from Agricultural Adjustment Act relative to milk orders, and text of Agricultural Marketing Agreement Act of 1937.....	219

SOME PROBLEMS INVOLVED IN ESTABLISHING MILK PRICES

INTRODUCTION

The importance of fluid-milk marketing and its problems has long been recognized by students in the field of marketing. This is evidenced by the numerous research projects that have dealt with different phases of the marketing of fluid milk. In addition, milk prices have been subject to an increasing degree of public interest and regulation by both State and Federal Governments. At the present time about 18 States have laws which authorize some degree of governmental control over the milk-price structure in the several States. The Agricultural Adjustment Act as approved May 12, 1933, and as amended August 24, 1935, provided for the regulation of the handling of milk in the current of interstate commerce, or such handling which "directly burdens, obstructs, or affects" interstate or foreign commerce in milk and its products.¹ These provisions were amended and reenacted in the Agricultural Marketing Agreement Act of 1937, approved June 3, 1937.

Since 1933 the authors of this treatise have come into almost continuous contact with numerous problems relating to milk prices in connection with their work in the Dairy Section of the Agricultural Adjustment Administration. This Section has the duty of aiding in the development and administration of Federal programs for the dairy industry which are authorized by the legislation cited. The problems encountered frequently involve consideration of the economic factors and principles underlying the structure of milk prices. As a matter of fact, most of the problems encountered in milk marketing are related in a greater or lesser degree to the price structure for milk. For example, country station charges, transportation rates, and the like are related to milk prices, but it is probable that in many cases the relevancy of such charges to prices f. o. b. the city and prices paid producers is not adequately considered in bargaining for prices.

Most of the research in milk-marketing deals with only a few phases of the matter, such as transportation costs and types of pools, and there has been no recent comprehensive general treatment of the economic principles underlying the structure of milk prices in fluid-milk markets. During the course of their official duties, the authors have had to give consideration to such principles from time to time, and they believe it desirable that the results of such inquiries as they have made into the nature of milk prices be made available.

This treatise is not intended to be other than an introductory inquiry into the nature of prices in fluid-milk markets and into some

¹ Title I, Public, No. 10, 73d Cong.; Sec. 8c, Public, No. 320, 74th Cong., 1st sess.; and Public, No. 137, 75th Cong.

of the problems encountered in pricing milk. As a matter of fact, the subject matter is limited primarily to consideration of factors affecting the structure of prices charged distributors and prices received by producers. In developing the analysis many problems connected with milk marketing have been given little consideration, if any. This is true for several reasons: First, complete treatment of the most important problems found in milk marketing would involve a work of tremendous magnitude. Second, detailed study of many problems must, perforce, be left for later studies when more data and information become available. Third, it was felt that if the general economic framework of milk prices were developed, research in connection with milk prices and related subjects could be developed more readily.

The general scheme of presentation followed in this treatise has been that of developing certain facts relative to milk prices and then developing the economic considerations underlying such facts. Chapter 1 is largely a description of the dairy industry in the United States, dealing with such information as trends in production, farm utilization, production of manufactured dairy products, and farm prices of dairy products. Chapter 2 describes in a general way some aspects of fluid-milk markets, while chapter 3 includes descriptive material relative to the demand for and supply of milk. Chapter 4 deals with the development of the general theory of milk prices. In this chapter simple markets are first considered, and then more complex aspects of milk markets are introduced by varying the assumptions as to types of markets. In chapter 5 some problems in pricing milk are discussed, and in chapter 6 the discussion is focused upon problems encountered in prorating among producers the proceeds of sales to distributors. Chapter 7 sets forth certain considerations relative to public policy and the milk trade.

The authors wish to express their appreciation for the comments and suggestions of the following persons who have read this treatise in manuscript form: Mr. A. H. Lauterbach, manager, Inter-State Milk Producers' Association, Inc.; Mr. B. F. Beach, secretary-manager, Michigan Milk Producers' Association, Inc.; Dr. T. G. Stitts, Farm Credit Administration; Dr. Harold Rowe of the Brookings Institution; Dr. Warren Waite, University of Minnesota; Mr. Don Anderson, University of Wisconsin; Dr. Budd A. Holt, Division of Marketing and Marketing Agreements; and Messrs. W. D. Hunnicut, W. P. Sadler, Paul L. Miller, C. S. Smith, O. H. Hoffman, and E. M. Harmon, members of the staff of the Dairy Section.

The authors, however, are responsible for any conclusions stated herein.

CHAPTER 1

THE DAIRY INDUSTRY IN THE UNITED STATES

The purpose of this chapter is to set forth general information relative to the dairy industry in the United States. While this treatise deals primarily with milk prices in fluid-milk markets, it appears desirable to present a general description of the industry in order to give those readers who are not familiar with it some basic information as a background, even though such information may not appear particularly relevant to the major purpose of the treatise.

I. FARM PRODUCTION

Total milk production, which for the last 6 years has averaged over 100,000,000,000 pounds per year, is determined by the number of cows milked and by milk production per cow. These two factors are influenced by numerous other factors. The number of milk cows is associated with such factors as feeding and growing conditions and the relative profitableness of the dairy industry in comparison with other agricultural enterprises. From 1900 to 1934 the number of milk cows and heifers 2 years old and over kept for milk on farms (as of Jan. 1) showed a rather steady upward trend from 15,253,000 head in 1900 to 26,931,000 head in 1934. Since 1934 milk cow numbers have declined steadily to 25,041,000 head on January 1, 1937, a decline of about 7 percent. (See table 1.)

TABLE 1.—*Number of milk cows and heifers 2 years old and over on farms Jan. 1, 1900 to 1937, and number per 1,000 persons in the United States*

Year	Total number in thousands ¹	Number per 1,000 of population ²	Year	Total number in thousands ¹	Number per 1,000 of population ²	Year	Total number in thousands ¹	Number per 1,000 of population ²
1900-----	15, 253	203	1913-----	18, 526	193	1926-----	22, 432	192
1901-----	15, 521	202	1914-----	18, 930	193	1927-----	22, 286	188
1902-----	15, 787	201	1915-----	19, 526	196	1928-----	22, 287	186
1903-----	16, 073	201	1916-----	20, 064	198	1929-----	22, 508	186
1904-----	16, 459	201	1917-----	20, 541	200	1930-----	23, 032	188
1905-----	16, 842	202	1918-----	21, 021	202	1931-----	23, 820	193
1906-----	17, 277	203	1919-----	21, 219	203	1932-----	24, 896	200
1907-----	17, 650	204	1920-----	21, 455	203	1933-----	25, 936	207
1908-----	17, 937	203	1921-----	21, 456	199	1934-----	26, 931	213
1909-----	18, 154	202	1922-----	21, 851	200	1935-----	26, 069	205
1910-----	18, 206	199	1923-----	22, 138	199	1936-----	25, 439	199
1911-----	18, 244	196	1924-----	22, 331	197	1937-----	25, 041	194
1912-----	18, 312	194	1925-----	22, 575	196			

¹ Compiled from reports of the Bureau of Agricultural Economics.

² Computed from column 2 and the following population series: 1910-30, Scripps' Foundation estimates of population on Jan. 1; 1900-1909, estimates from Scripps' Foundation figure for Jan. 1, 1910, by assuming an annual change of 1,618,000, which was the average increase indicated by the census of 1900 and 1910; 1931-35, Bureau of Census estimates; 1936-37, estimates, assuming annual increases during 1935 and 1936 of 908,000, the Bureau of Census estimate of the increase from July 1, 1935, to July 1, 1936.

These figures are more significant when considered in relation to human population. The number of milk cows per 1,000 persons reached the highest point of record since 1900 in 1934, when there were 213 cows per 1,000 people in the United States. On January 1, 1937, it is estimated that there were about 194 milk cows per 1,000 persons, which is slightly below the 38-year average of about 198 head. (See fig. 1.)

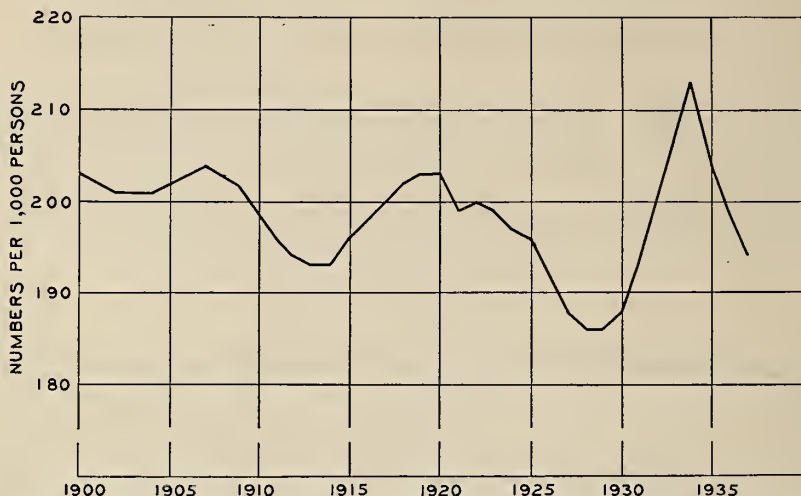


FIGURE 1.—Number of milk cows and heifers 2 years old and over kept for milk on farms per 1,000 persons, 1900–37.

The marked reduction in milk-cow numbers that has taken place in the last 2 years has been due to a combination of factors. The price of meat animals has improved markedly in recent years, because of an improvement in demand conditions and the decrease in the number of such animals due largely to droughts in 1934 and 1936, with the result that producers have tended to stop milking cows of beef or dual-purpose types. The milking of beef and dual-purpose cows when price conditions warrant is probably of much more importance in relation to total milk production in some geographic divisions than in others. In the census of 1930 the following question was asked: "Of the cows and heifers milked, how many were mainly of beef or of dual-purpose breeding?" The percentage that beef cows milked were of cows milked in 1929, by geographic divisions, was: North Atlantic, 3.8 percent; East North Central, 9.2 percent; West North Central, 31.2 percent; South Atlantic, 10.1 percent; South Central, 11.2 percent; Western, 18.6 percent; and for the United States, 16.0 percent. The increase in meat prices also has tended to cause dairy farmers to cull more closely than they did in the earlier years of the depression. In addition, the severe droughts of 1934 and 1936 resulted in the forced marketing of large numbers of cattle, due to a marked scarcity of feed, both through regular commercial channels and through sale to the Government in the emergency cattle purchase program of 1934. The decreases in milk-cow numbers during the last 3 years have not been uniform throughout the country as a whole, and the de-

creases have been greatest in the principal manufactured dairy products regions. Compared with the peak numbers in most regions on January 1, 1934, the January 1, 1937, numbers represent decreases of about 13.5 percent in the West North Central region, 6.5 percent in the South Central and Western regions, and about 4 percent in the East North Central, with slight decreases in the North and South Atlantic regions.

The geographic distribution of milk-cow numbers as of April 1, 1930, is shown in figure 2. The heaviest concentration of milk cows was in southeastern Wisconsin and northern Illinois, with a fairly heavy concentration shown in southern Minnesota, northern Vermont, certain sections of New York, northeastern Iowa, and sections of Indiana, Ohio, and Michigan.

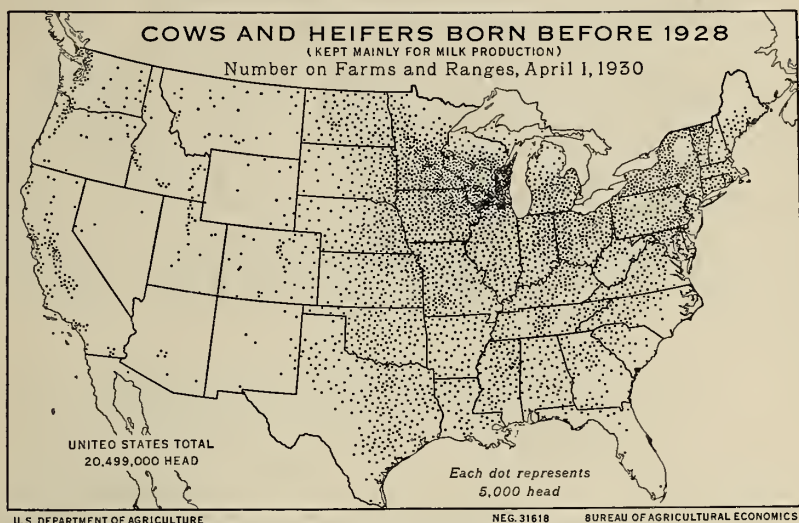


FIGURE 2.—Cows and heifers born before 1928 (kept mainly for milk production); number on farms and ranges, April 1, 1930.

There are wide variations in the distribution of milk cows by size of herd in different geographic divisions. For the United States as a whole it is estimated that in 1929 about 28.2 percent of the milk cows were in 6- to 10-cow herds. In the North Atlantic division the largest number of cows was in 11- to 20-cow herds, with the East and West North Central and the Western geographic divisions showing the greatest proportion of milk cows in the 6- to 10-cow class. In the South Atlantic and South Central divisions milk-cow numbers are largely concentrated in herds of three cows or less in size. (See table 2.) In States such as the North Atlantic States, where a larger portion of the milk produced is sold in fluid-milk markets, herds tend to be larger in size than in those areas where the greater portion of the milk is used in the production of manufactured dairy products.

TABLE 2.—*Estimated percentage of total number of milk cows in herds of various sizes, by geographic divisions, 1929*

Geographic division	Size of herd						
	1 cow	2-3 cows	4-5 cows	6-10 cows	11-20 cows	21-30 cows	31-50 cows
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
North Atlantic.....	2.4	6.9	8.3	23.1	33.1	15.2	7.9
East North Central.....	2.2	10.7	15.5	31.6	30.5	7.0	2.0
West North Central.....	1.8	9.0	15.5	40.7	27.7	3.9	1.1
South Atlantic.....	23.7	30.9	12.3	12.8	10.0	4.0	3.2
South Central.....	17.4	32.1	17.4	16.8	8.6	3.0	2.5
Western.....	3.9	10.1	11.4	23.0	21.0	9.4	9.0
United States.....	6.5	14.9	14.3	28.2	23.8	6.5	3.4

Compiled from Shepard, John B., and Smith, R. K., Statistical Supplement No. 9 to Milk Production Trends, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

Trends in milk-cow numbers for the United States and by geographic divisions are shown in table 3 and figure 3, expressed as relatives with the year 1920 as the base period (1920=100). For the United States, milk-cow numbers reached in 1934 a peak 38 percent higher than in 1920. In 1934 numbers reached a peak in all geographic divisions except the North Atlantic region where the peak was reached in 1933, and the South Atlantic division where peak numbers were reached in 1935. Since 1934 there have been material decreases in milk-cow numbers in all geographic divisions except the North Atlantic and South Atlantic divisions, where the decreases have been relatively small.²

TABLE 3.—*Number of milk cows and heifers 2 years old and over and percentage of the number in 1920, by regions, 1925-36*

Year	North Atlantic		North Central		South Atlantic		South Central		Western		United States	
	Thous- ands	Per- cent of 1920	Thous- ands	Per- cent of 1920	Thous- ands	Per- cent of 1920	Thous- ands	Per- cent of 1920	Thous- ands	Per- cent of 1920	Thous- ands	Per- cent of 1920
1920.....	3,341	100	9,560	100	1,673	100	3,560	100	1,541	100	19,675	100
1925.....	3,208	96	11,720	122	1,760	105	3,923	110	1,964	127	22,575	115
1926.....	3,113	93	11,685	122	1,706	102	3,952	110	1,976	128	22,432	114
1927.....	3,001	90	11,624	121	1,650	99	4,025	113	1,986	129	22,286	113
1928.....	2,993	90	11,527	120	1,652	99	4,093	115	2,022	131	22,287	113
1929.....	2,076	89	11,606	121	1,652	99	4,215	118	2,059	134	22,508	114
1930.....	3,035	91	11,988	125	1,678	100	4,303	121	2,102	136	23,106	117
1931.....	3,127	94	12,393	130	1,743	104	4,463	125	2,159	140	23,885	121
1932.....	3,213	96	12,918	135	1,833	110	4,800	135	2,218	144	24,982	127
1933.....	3,260	98	13,403	140	1,930	115	5,151	145	2,286	148	26,030	132
1934.....	3,256	97	14,105	147	1,995	119	5,446	153	2,347	152	27,059	138
1935.....	3,173	95	13,397	140	2,022	121	5,380	151	2,264	147	26,236	133
1936.....	3,177	95	13,055	136	1,994	119	5,193	146	2,203	143	25,622	130

¹ Milk cows and heifers 2 years old and over, as reported by the Bureau of Census.

Compiled from reports of the Bureau of Agricultural Economics.

² For purposes of presentation, the East North Central division, comprised of the States of Ohio, Indiana, Illinois, Michigan, and Wisconsin, and the West North Central division, comprised of the States of Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas, have been treated as one division. Decreases in milk-cow numbers since 1934 have been more marked in the West North Central division than in the East North Central division.

Estimated total milk production on farms in the United States increased steadily from 87,069,000,000 pounds in 1924 to 104,722,000,000 pounds in 1933. Total milk production declined sharply in 1934 to 101,467,000,000 pounds, largely on account of the severe drought in that year, but the year 1935 showed a slight increase over 1934 figures, total production amounting to 101,756,000,000 pounds.³

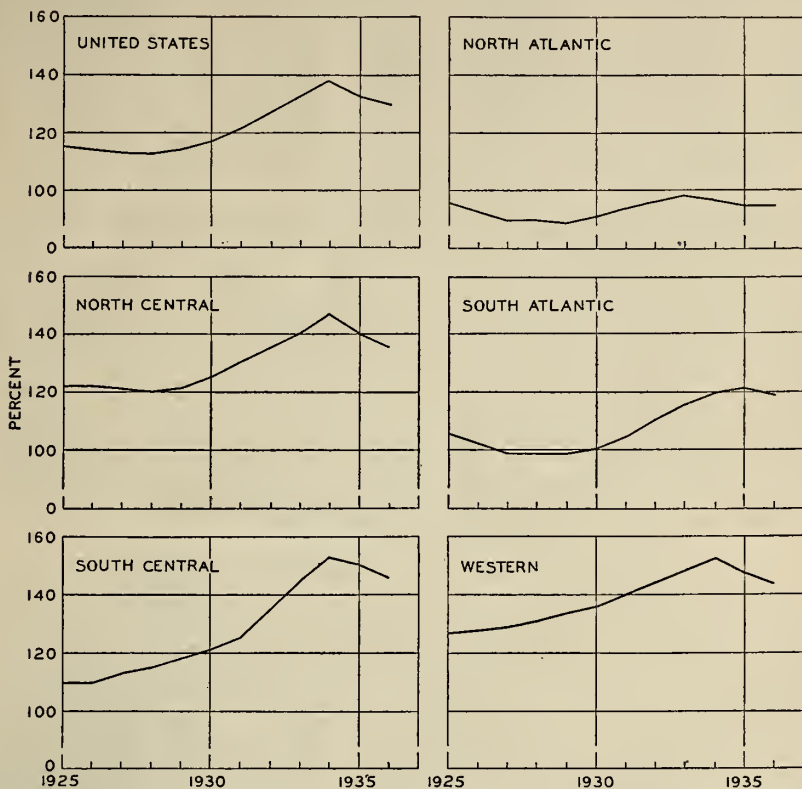


FIGURE 3.—Indices of number of milk cows and heifers 2 years old and over, for the United States and by geographic divisions, 1925-36 (1920=100).

It appears that the larger portion of the milk produced in the United States is produced by the herds in the 6- to 10-cow and 11- to 20-cow classifications, which in 1932 accounted for about 27.5 percent and 28.5 percent, respectively, of total milk production. Estimated milk production per cow is lowest in 2- to 3-cow herds and highest in the herds having over 50 cows, being 79.7 percent and 134.8 percent, respectively, of the average production per cow in 1932 in the United States. (See table 4.)

³ Milk production trends, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, Aug. 31, 1936. The figures since 1933 are not strictly comparable to those for preceding years. The Federal agricultural census of 1935 showed a larger increase in farms reporting cattle than were enumerated in 1930, hence the figures for 1933-35 have been tentatively revised upward. The estimates will be revised further on the basis of 1935 census figures on cows milked and on milk production. The unrevised estimates for 1933 and 1934 are 102,309,000,000 pounds and 98,940,000,000 pounds, respectively.

TABLE 4.—*Estimated number of milk cows, production per cow, and total milk production in the United States, by size of herd, 1932*

Number of cows in herd	Milk cows	Percent of total number of cows	Milk per cow	Percent of average	Milk production	Percent of total milk production
	<i>Thousands</i>		<i>Pounds</i>		<i>Million pounds</i>	
1.....	1,380	5.8	3,661	85.0	5,052	5.0
2-3.....	3,227	13.6	3,435	79.7	11,085	10.9
4-5.....	3,180	13.5	3,721	86.4	11,833	11.6
6-10.....	6,616	28.0	4,235	98.3	28,018	27.5
11-20.....	6,088	25.8	4,763	110.5	28,997	28.5
21-30.....	1,778	7.5	5,209	120.9	9,262	9.1
31-50.....	820	3.5	5,405	125.4	4,432	4.3
Over 50.....	548	2.3	5,810	134.8	3,184	3.1
Total or average.....	23,637	100.0	4,309	100.0	101,863	100.0

Compiled from Shepard, John B., and Smith, Richard K., Statistical Supplement No. 9 to Milk Production Trends, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics.

Milk production per cow has varied materially in recent years, showing a steady increase from 4,074 pounds per cow in 1924 to 4,582 pounds per cow in 1929 and a decrease to 4,012 pounds per cow in 1934.⁴ The decreases in production per cow from 1929 to 1934 were probably due in large part to reduced culling of dairy herds and to the milking of more beef and dual-purpose cows. The reduction in 1934 was undoubtedly due mostly to reduced feeding engendered by the drought. It is probable that at the present time dairy herds have been culled fairly closely, so that the productive capacity per cow is probably higher than in recent years.

II. DISPOSAL OF MILK PRODUCED ON FARMS

The milk produced on farms is disposed of in several ways, such as being used for (1) milk and cream on farms where produced, (2) making butter on farms, (3) calf feeding, (4) skimming or separating for sale as butterfat, (5) retail sale by producers in the form of milk and cream, and (6) wholesale sale as milk in bulk form. These channels of disposal represent the form in which the milk is finally consumed in those cases in which it is used for milk and cream on farms where produced, for making farm butter, for retail sales, and for calf feeding on farms where produced. The milk which is skimmed or separated for sale as butterfat is used almost entirely in the manufacture of butter while that sold wholesale in bulk is used in the manufacture of evaporated and condensed milk, cheese, ice cream, and for distribution as fluid milk and fluid cream.

The greater portion of the milk produced on farms in the United States is skimmed or separated for sale as butterfat in cream and sold wholesale in bulk, these two channels of disposal accounting for 33.6 percent and 33.7 percent, respectively, of the milk produced on farms in 1934. (See table 5.) The remaining channels of disposal account for much smaller percentages of total production, 12.1 percent being used as milk and cream on the farm where produced, 10.8 percent for making butter on farms, 7.1 percent for retail sale as milk and cream, and 2.7 percent for calf feeding.

⁴ Tentative revision of earlier 1934 estimates (see above). The unrevised estimates for 1933 and 1934 are 4,178 pounds per cow and 4,030 pounds per cow, respectively.

TABLE 5.—*Utilization of milk produced on farms, by geographic divisions and for the United States, 1934*

Geographic division	Used as milk or cream on farms where produced		Used for making butter on farms		Fed as whole milk to calves	
	Million pounds	Percent of total	Million pounds	Percent of total	Million pounds	Percent of total
North Atlantic.....	1,106	6.9	1,945	5.9	458	2.8
East North Central.....	2,469	9.2	1,185	4.4	767	2.9
West North Central.....	2,949	11.2	2,065	7.8	807	3.1
South Atlantic.....	1,389	24.4	2,022	35.5	113	2.0
South Central.....	3,137	24.0	3,953	30.3	185	1.4
Western.....	958	8.7	510	4.6	329	3.0
United States.....	12,008	12.1	10,685	10.8	2,659	2.7

Geographic division	Skimmed or separate for sale as butterfat		Sold as milk or market cream			
			Retailled by producers ¹		Sold wholesale ²	
			Million pounds	Percent of total	Million pounds	Percent of total
North Atlantic.....	618	3.8	1,974	12.4	10,960	68.2
East North Central.....	7,922	29.6	1,543	5.8	12,893	48.1
West North Central.....	17,386	66.1	1,978	3.7	2,128	8.1
South Atlantic.....	394	6.9	613	10.8	1,159	20.4
South Central.....	3,104	23.8	934	7.1	1,752	13.4
Western.....	3,851	34.9	950	8.6	4,429	40.2
United States.....	33,275	33.6	6,992	7.1	33,321	33.7

¹ Approximations based chiefly on the population in small towns and rural areas where most families purchase their milk directly from local farmers. The milk equivalent of cream is included.

² Estimates include milk delivered to creameries, condenseries, cheese factories, market-milk receiving stations, etc., but exclude market milk sold to other farmers for local retail delivery.

Compiled from reports of the Bureau of Agricultural Economics.

There are marked regional variations in the proportions of total milk produced entering the several channels of disposal. The greater portion of the milk produced in the North Atlantic and East North Central divisions is sold wholesale in the form of bulk milk, 68.2 percent and 48.1 percent, respectively, of the milk produced in these divisions being sold in this form in 1934. In the West North Central division, the major manufactured-products area, 66.1 percent of the milk produced was skimmed or separated for sale as butterfat. The two most important channels of disposal in the South Atlantic and South Central divisions are (1) use as milk and cream on farms where produced and (2) use for making butter on farms. These channels of disposal taken together accounted for more than half of the milk produced in these divisions in 1934, with the volumes entering each use in each area roughly equal. (See fig. 4.)

There are significant variations, by size of herd, in the relative volumes of milk entering the several channels of disposal. For the one-cow herds 90.8 percent of the milk produced on these farms in 1932 was used for making butter and for food on the farms where produced, 46.5 percent and 44.3 percent of total production being accounted for in these uses, respectively. At the other extreme, 88.7 percent of the milk produced on farms having over 50 cows was sold as milk. In all herds in the United States, 40.0 percent of the milk was sold as milk and 34.2 percent was sold as cream (butterfat). (See table 6.) On the one-cow farms only 6.7 percent of the milk produced was sold, while 96.2 percent of the milk produced on farms having over 50 cows was sold.

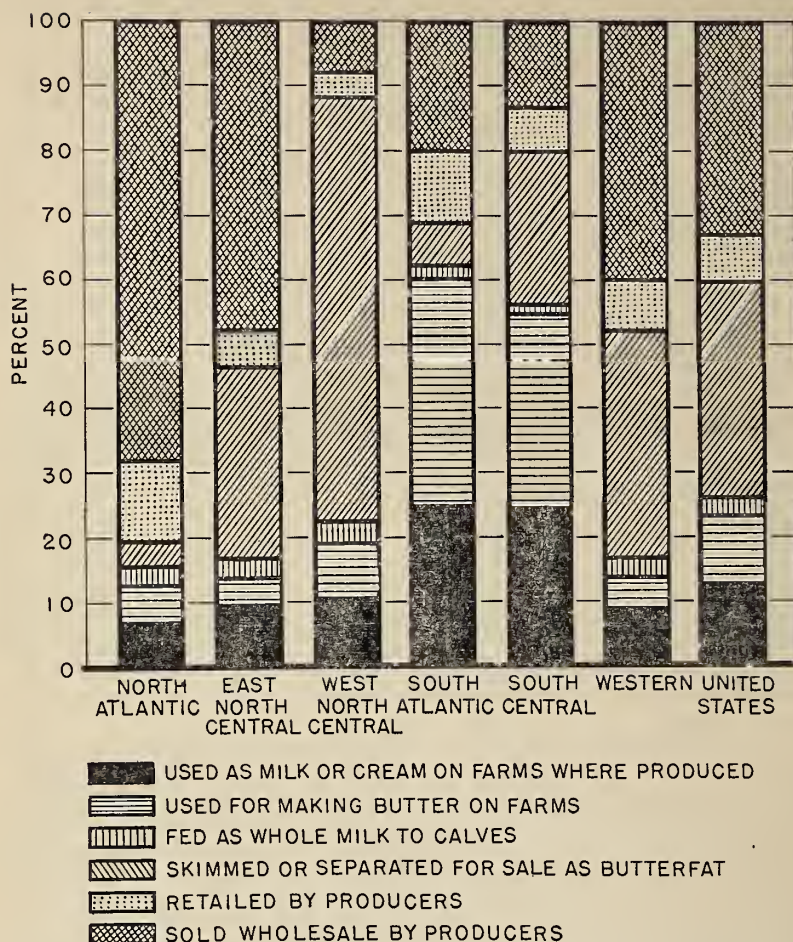


FIGURE 4.—Disposal of milk produced on farms, in the United States and by geographic divisions, 1934.

TABLE 6.—Relative volumes of milk sold in each form or used for each purpose in the United States, by size of herd, 1932

Channel of disposal	Size of herd								
	1 cow	2-3 cows	4-5 cows	6-10 cows	11-20 cows	21-30 cows	31-50 cows	Over 50 cows	All farms
Sold:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
As milk.....	3.0	8.3	16.4	32.7	53.1	72.5	81.8	88.7	40.0
As cream (butterfat).....	3.7	22.4	46.4	48.7	35.8	20.0	12.5	7.5	34.2
Used on farm where produced:									
For making butter.....	46.5	37.4	17.8	7.0	2.8	1.2	.7	.3	11.3
For human food.....	44.3	28.8	16.4	8.8	5.5	3.8	2.8	1.9	11.7
For feeding calves.....	2.5	3.1	3.0	2.8	2.8	2.5	2.2	1.6	2.8
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Computed from data given in table 4, Statistical Supplement No. 9 to Milk Production Trends, Bureau of Agricultural Economics.

III. UTILIZATION OF MILK

Of the total volume of milk used in the manufacture of dairy products in factories and used by the nonfarm population as fluid milk and cream in 1935, about 39.8 percent was used in the form of fluid milk and cream and about 60.2 percent was used in manufactured dairy products. Of the total amount of milk entering the two general types of use, 43.5 percent was manufactured into butter, 8.2 percent into cheese, 5.2 percent into evaporated milk, and 3.3 percent into other manufactured dairy products.⁵

IV. PRODUCTION OF MAJOR MANUFACTURED DAIRY PRODUCTS

Annual production of creamery butter has shown a continuous upward trend for many years. In 1920 production amounted to 863,577,000 pounds, and reached the highest point of record in 1933 when 1,762,688,000 pounds were produced. These figures do not represent net increases in total butter production, since during this period there was a steady decline in the production of farm butter from 694,803,000 pounds in 1920 to 566,200,000 pounds in 1933.

Creamery-butter production is concentrated largely in the West North Central and East North Central geographic divisions. In 1935 these two divisions produced 799,629,000 pounds and 465,282,000 pounds, respectively, as compared to total United States production of 1,632,380,000 pounds.⁶ Table 7 shows the relative changes in creamery-butter production in the United States and by geographic divisions since 1920, expressed as percentages of production in 1920 (1920=100). The South Central and South Atlantic divisions show the greatest increases, followed by the North Central division (East North Central and West North Central divisions combined), where production in 1935 was 196 percent of production in 1920. There have been material decreases in creamery-butter production since 1933 in all regions except the North Atlantic, where production was slightly higher in 1935 than in 1933, and actually higher than in any year since 1928.

TABLE 7.—*Indices of creamery-butter production in the United States and by geographic divisions, 1920-35*

[1920=100]

Year	United States	North Atlantic	North Central	South Atlantic	South Central	Western
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1920.....	100.0	100.0	100.0	100.0	100.0	100.0
1921.....	122.2	128.3	123.5	121.2	130.6	111.2
1922.....	133.6	118.9	137.3	144.2	139.2	118.3
1923.....	143.8	102.1	147.2	177.5	157.2	137.3
1924.....	157.0	117.0	161.8	187.3	167.0	143.7
1925.....	157.7	88.1	166.0	174.1	165.1	138.8
1926.....	168.1	80.7	176.9	179.6	201.4	146.3
1927.....	173.3	74.9	178.2	231.3	266.2	156.3
1928.....	172.2	67.3	179.2	215.6	250.1	151.9
1929.....	184.9	55.8	193.7	217.8	287.8	165.4
1930.....	184.7	56.4	193.0	207.8	261.9	167.8
1931.....	193.1	56.4	201.3	215.3	293.6	173.1
1932.....	196.2	53.9	202.7	254.5	347.2	171.4
1933.....	204.1	63.4	210.7	277.5	370.0	173.5
1934.....	196.2	65.4	204.3	249.3	327.7	165.0
1935.....	189.0	64.9	196.0	252.2	326.9	158.7

Computed from reports of the Bureau of Agricultural Economics.

⁵ Compiled from reports of the Bureau of Agricultural Economics.

⁶ Appendix A, table 51.

Map of the United States showing the percentage of the population aged 65 and over in 1960. The percentages for each state are as follows:

State	Percentage
Alaska	2.3
Arizona	.1
California	3.9
Colorado	.1
Connecticut	.9
Delaware	.4
District of Columbia	.7
Florida	*
Georgia	.1
Idaho	.8
Illinois	16.7
Indiana	4.7
Iowa	2.4
Kansas	.1
Kentucky	1.3
Louisiana	.1
Maine	*
Maryland	.4
Massachusetts	.9
Michigan	9.8
Minnesota	2.2
Mississippi	.2
Missouri	4.3
Montana	.5
Nebraska	2.4
Nevada	.1
New Hampshire	*
New Jersey	.7
New Mexico	1.1
New York	2.1
North Carolina	.2
North Dakota	.3
Ohio	5.4
Oklahoma	2.4
Oregon	1.8
Pennsylvania	5.1
Rhode Island	*
South Carolina	.1
South Dakota	.1
Tennessee	1.0
Texas	1.6
Vermont	*
Virginia	.4
Washington	1.7
West Virginia	.4
Wisconsin	4.4
Wyoming	.1

* LESS THAN ONE-TENTH OF ONE PERCENT

The dry-skim-milk industry has grown more rapidly than any of the other manufactured dairy products industries, the production of 297,506,000 pounds in 1935 being about seven times as large as production in 1920. The East North Central, North Atlantic, and Western geographic divisions lead in the production of this commodity, producing 104,398,000 pounds, 84,934,000 pounds, and 71,714,000 pounds, respectively, in 1935. (For details see appendix A, table 54.)

⁸ Appendix A, table 53.

out in the preceding section, is used in the production of a number of different products, is the aggregate or composite demand for milk in all uses. Thus although the different forms or products in which milk is used are competitive in the sense that each use competes with all other uses for a portion of the total supply of milk, and the derived demands are rival or competitive, in the aggregate they comprise the total demand for milk.

Numerous factors influence the demand for dairy products, such as the volume of money income of consumers, their consuming habits, and the prices of competing food products. Perhaps the most important of the factors affecting the demand for dairy products is the volume of money consumers have available for the purchase of goods. Several indices of income are available, among these being the index of factory pay-roll totals and the index of national income. Generally speaking, and assuming constant supplies, the prices of dairy products vary directly with changes in the income of consumers. Taking the index of pay-roll totals as a measure of the income of consumers, it appears that most of the changes in the index numbers of prices received by farmers for dairy products during the period 1920-35 were associated with changes in the income of consumers. (See fig. 8.) It should be noted in this connection that per capita supplies did not vary materially during this period.

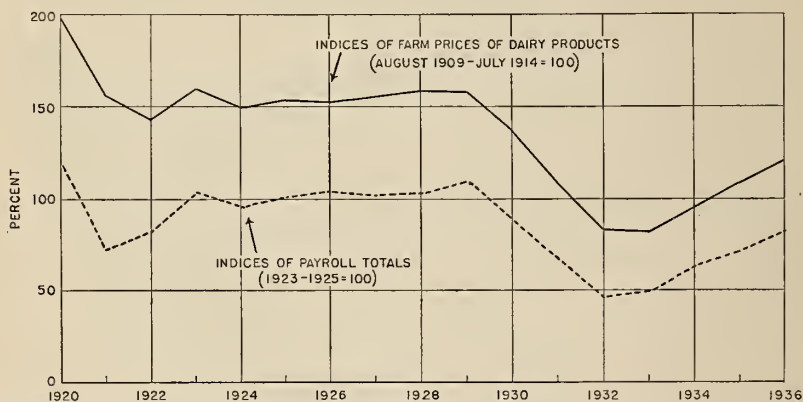


FIGURE 8.—Indices of United States farm price of dairy products and indices of pay-roll totals in manufacturing industries, 1920-36.

The changes in the volume of milk that will be forthcoming from a given number of cows, on account of changes in weather, pasture, and crop conditions, need little consideration here, since it is obvious that sudden and wide variations in the weather, such as droughts and other unusual conditions which operate to reduce or increase the quantity of feed relative to the number of livestock, all tend to cause variations in the supply of milk.

Aside from the factors noted above, changes in the prices of dairy products relative to the prices paid by milk producers for the articles farmers use in milk production, as well as changes in the prices of dairy products relative to the prices of other farm products, affect the volume of milk production. In certain sections of the Middle West, for example, changes in the prices of competing farm products have an impor-

tant effect on milk production. An increase in the price of beef, or a relative decline in dairy-product prices, is sufficient to cause large numbers of farmers in this section, particularly west of the Mississippi, to turn to the production of beef steers and heifers and to milking fewer beef-type cows.⁹ Also in numerous cases where more than one livestock enterprise is followed on the farm, a relatively larger volume of the feed available probably will be fed to livestock other than milk cows when prices of alternative livestock products become favorable as compared to the prices of dairy products.

In addition to the foregoing, the interchangeability of the milk supply among uses, particularly manufacturing uses, has an important effect upon the farm-price structure of dairy products. This factor tends to keep the prices of manufactured dairy products and the prices paid farmers for milk entering the different products closely related, at least over any appreciable period of time. Generally speaking, there are no marked differences between the quality requirements for milk used in the production of evaporated milk, butter, cheese, and other manufactured dairy products. Also, in many cases the plants manufacturing the various products are fairly well intermingled geographically, and in some cases one plant manufactures several different products. Under such conditions an increase in the price of a particular manufactured product in relation to others will tend to result in a diversion of milk from the relatively lower-priced product to the higher, bringing about an increase in the production and a decrease in the price of the latter, until the usual relationship is again restored.

The interchangeability of the supply of milk between milk produced for use as fluid milk and that produced for use in the production of various manufactured dairy products is not so marked as the interchangeability of milk among the different manufactured products. This is due in large part to the fact that in most milk markets milk used as fluid milk must be produced in accordance with more stringent sanitary requirements than is the case with milk produced for use in manufactured dairy products. However, this factor operates principally to lengthen the period of time a producer requires to shift his disposal of milk from manufactured dairy products uses to fluid use. The producer, in order to shift from the production of manufacturing milk to the production of fluid milk, must meet the sanitation requirements in the health ordinances of the city or town in which he wishes to sell fluid milk. This usually involves additional expense in producing milk, but if the farm price of fluid milk is sufficiently above the farm price of manufacturing milk the producer will make the necessary changes. Although the degree of interchangeability of milk between fluid use and manufactured product uses is less marked than the degree of interchangeability of milk among the different manufactured product uses, producers can and do shift from the production of manufacturing milk to the production of fluid milk when price relationships warrant. Similarly, when the price of fluid milk declines until it does not cover the additional costs of producing milk for fluid consumption, producers discontinue the production of milk for consumption as fluid milk and produce milk for use in the manufacture of dairy products.

As was pointed out above, the supply of milk is markedly interchangeable among uses in the case of milk produced for manufacturing purposes and to a lesser extent between fluid milk and manufacturing

⁹ See also Black, John D., *The Dairy Industry and the AAA*, p. 31.

milk uses. Also, most areas produce both fluid milk and milk for manufacturing purposes. These factors operate to establish close relationships between the price of milk in different uses, in the country as a whole as well as within given areas. (See fig. 9.) Thus although the price of milk produced for use as fluid milk is generally higher in any particular area than the price of milk produced for use in manufactured dairy products (see ch. IV), and therefore the market for fluid milk in any particular area may be considered as a local market, the price of milk produced for use as fluid milk varies with the price of such milk in any other area and also varies with the price of milk produced for use in manufactured dairy products, both for the country as a whole and in the various sections of the country.

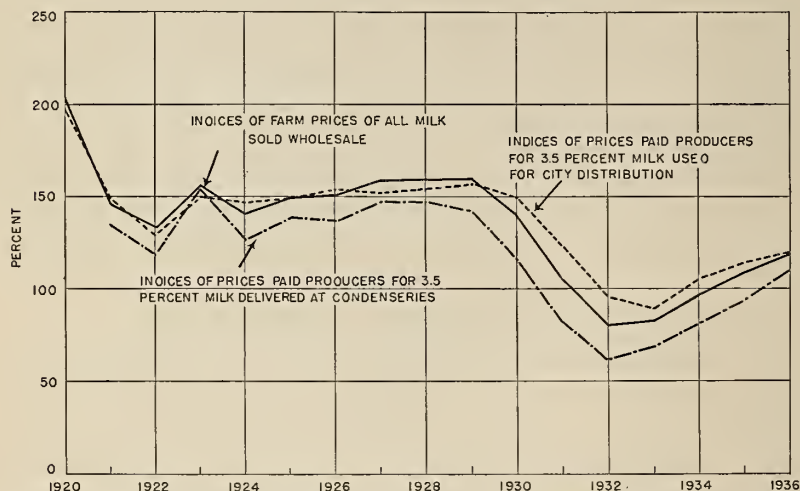


FIGURE 9.—Indices of farm prices for all milk sold wholesale, indices of prices paid to producers for 3.5 percent milk delivered at condenseries, and indices of prices paid by milk dealers for milk testing 3.5 percent butterfat, used for city distribution as milk and cream, United States, 1920-36 (1910-14=100).

Since most manufactured dairy products are readily transported, the price of a product such as butter tends to vary between markets by not more than the amount necessary to cover the cost of shipping the product (freight and handling costs) from one market to another. (See table 8.) Thus in Chicago, Ill., situated in the large surplus butter-producing area comprising the East North Central and West North Central States, the price of butter is generally lower than in New York City by an amount sufficient to cover freight and handling charges from Chicago to New York City (New York City being located in a deficit butter-producing area). The decidedly close relationships between the prices of butter in different markets are shown in figure 10.

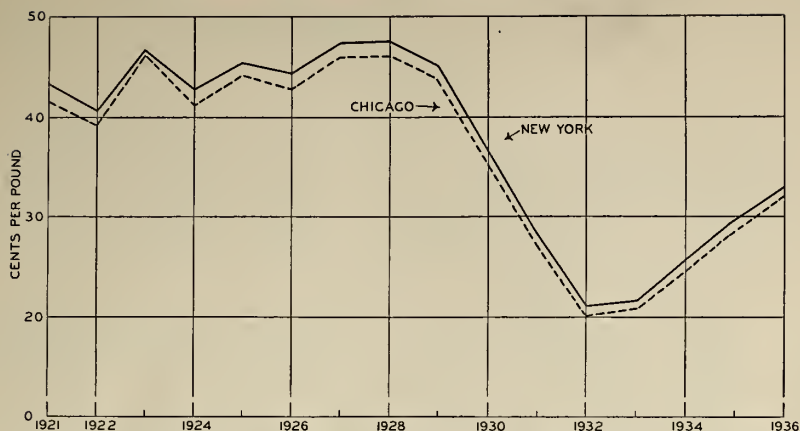


FIGURE 10.—Wholesale price of 92-score creamery butter at New York City and at Chicago, 1921-36.

The prices of cheese in different markets vary similarly (see fig. 11), partly for the reasons advanced above with respect to butter and partly because of the possibility of shifting from cheese production to the production of butter, which is more widely transported. The same relationships exist with respect to evaporated milk.

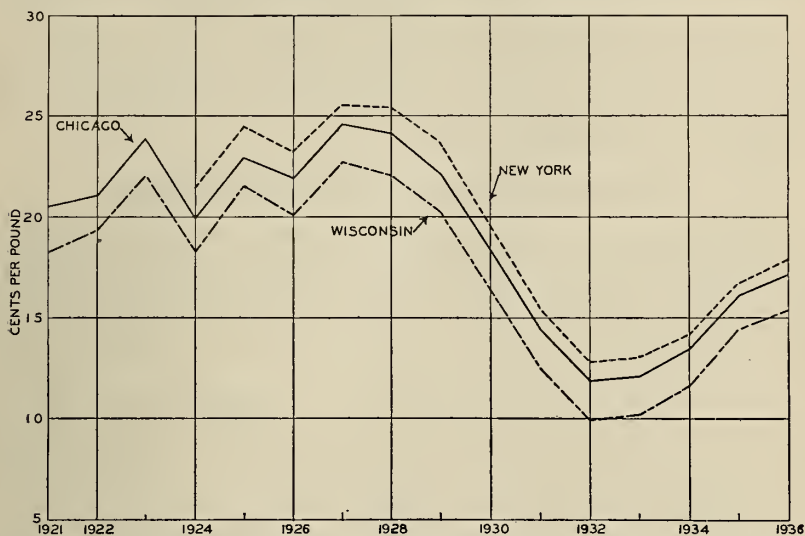


FIGURE 11.—Wholesale prices of American cheese—New York Single daisies, Chicago single daisies, and Wisconsin twins, 1921-36.

TABLE 8.—*Wholesale prices of butter and cheese, index numbers of milk prices, and index numbers of pay-roll totals, by years, 1920-36*

Year	Whole-sale price of 92-score butter at New York, per pound	Whole-sale price of 92-score butter at Chicago, per pound	Wholesale prices of American cheese			Index numbers of farm prices of all milk sold wholesale (August 1909-July 1914=100)	Index numbers of prices paid to producers for 3.5 percent milk at condenseries (1910-14=100)	Index numbers of prices paid by milk dealers for 3.5 percent milk used for city distribution (1910-14=100)	Index numbers of pay-roll totals (1923-25=100)
			New York single daisies, per pound	Chicago single daisies, per pound	Wisconsin twins (Wisconsin Cheese Exchange), per pound				
	Cents	Cents	Cents	Cents	Cents	Percent	Percent	Percent	Percent
1920.....	61.4	58.45			24.9	202		197	118.2
1921.....	43.3	41.67	21.46	20.53	18.3	146	134	149	76.9
1922.....	40.6	39.21		21.04	19.3	133	118	129	81.6
1923.....	46.8	46.03		23.86	22.1	156	153	150	103.3
1924.....	42.7	41.19	21.42	19.93	18.2	141	127	147	96.0
1925.....	45.3	44.07	24.44	22.99	21.5	149	138	149	100.7
1926.....	44.4	42.80	23.27	21.96	20.1	151	137	153	103.7
1927.....	47.3	45.78	25.51	24.6	22.7	153	147	152	101.7
1928.....	47.4	46.00	25.38	24.1	22.1	159	147	154	102.4
1929.....	45.0	43.75	23.63	22.2	20.2	159	142	157	109.1
1930.....	36.5	35.28	19.68	18.3	16.4	139	116	149	88.5
1931.....	28.3	27.05	15.41	14.4	12.5	106	82	123	67.4
1932.....	21.0	20.07	12.76	11.9	10.0	80	62	96	46.4
1933.....	21.6	20.79	13.08	12.12	10.2	82	68	89	49.4
1934.....	25.72	24.77	14.19	13.41	11.7	97	80	105	62.9
1935.....	29.79	28.81	16.75	16.09	14.4	108	93	113	71.3
1936.....	33.04	32.05	17.87	17.15	15.3	118	109	119	82.4

Compiled from records of the U. S. Department of Agriculture and the U. S. Bureau of Labor Statistics.

In view of the foregoing it should be evident that the market for the most important manufactured dairy products is national in character and that the price of milk or butterfat used in the various products noted above in any particular area is closely associated with the price of milk so used in any other area.

VI. INCOME FROM MILK PRODUCED ON FARMS

In terms of gross income from farm production the dairy industry is one of the most important agricultural enterprises. In 1935 the gross income from farm production of 78 crop and 13 livestock enterprises amounted to \$8,506,937,000. Of this amount it is estimated that \$1,680,625,000, or 19.8 percent, was accounted for by gross income from milk produced on farms.

There are wide regional variations in the proportion of gross farm income accounted for by dairy production. Milk production appears to be relatively most important in the North Atlantic division and least important in the South Atlantic division, where in 1935 gross income from milk produced on farms was 40.3 percent and 13.9 percent, respectively, of total gross income from farm production. (See table 9.)

CHAPTER 2

SOME FACTS AND CONSIDERATIONS CONCERNING THE STRUCTURE OF MILK MARKETS

The purpose of this chapter is to set forth certain facts and considerations regarding the structure of milk markets. The material presented is largely descriptive in nature and is intended to give a fairly complete idea of the marketing mechanisms or devices found in large milk markets, together with factual material concerning co-operative associations and their activities, the size of business of distributors, and the structure of milk prices. Mainly for purposes of presentation, the discussion follows the structure of the market from production through distribution.

I. HISTORICAL SKETCH OF THE DEVELOPMENT OF FLUID-MILK-MARKETING COOPERATIVES—LARGE-SCALE ORGANIZATION OF THE SUPPLY

For a long period there has been a definite trend toward the segregation of milk-production and milk-distribution units. Generally speaking, when cities were small most of the milk was distributed by producers to city consumers. As the cities grew in size and it became necessary to reach farther out into the country to secure a sufficient milk supply the disadvantages of milk distribution by milk producers became steadily more marked, because of the increasing distances over which it was necessary to travel, the more stringent regulations pertaining to the handling of milk, and the like. Firms were organized for the specific purpose of distributing milk, that is, purchasing it from farmers, processing it, and distributing it to consumers.¹¹ In most of the larger cities at the present time the larger portion of the milk business is in the hands of a few milk distributors. In many cases these distributors own milk-receiving stations in the country and have facilities available to process their daily and seasonal excess into products other than fluid milk.

This large-scale organization and operation of the milk-distributing business presumably was able to develop because of the economies gained in the assembly and distribution of milk. However, the tendency to large-scale distributing enterprises resulted in a somewhat different relationship between the producer and his market. Clyde L. King states the matter in this way:

With the development of these large industrial units came heavy investments both in the city and in the country that had to be protected. These investments were made in order to handle milk and its products most economically. One source of economy was the choice of favorable locations for receiving plants in order that they might be supplied with the volume of milk necessary to low cost per unit handled. Thus, it has come about gradually that in any one dairying

¹¹ Woolman, Henry N., "How Dairy Cooperatives Have Helped Distributors to Become More Efficient", American Cooperation, 1927, vol. II, pp. 389-390.

community there is now usually but one readily accessible receiving station at which the producer can, within a reasonable haul, find a sale for his milk.¹²

Thus instead of producer-distributors¹³ handling the larger portion of the milk sold in the market, or producers selling to small firms that distributed the milk, large firms developed, purchasing their supplies from numerous unorganized producers. In this situation producers apparently felt that they were not getting fair treatment and that they had too little to say about the prices they received, and were suspicious of the weights and tests made by distributors. Apparently, producers thought that they were in a disadvantageous position because of inequality of bargaining power with distributors, or, in other words, that they were forced to sell their milk to distributors under what practically amounted to a buying monopoly. It appears that one of the major reasons for the organization of farmers into collective bargaining units was that farmers thought that, through such collective bargaining, they could approach equality of bargaining power with distributors. This idea is expressed frequently in the literature dealing with fluid milk marketing.¹⁴

Bartlett apparently leans toward the same explanation of the development of cooperative milk-marketing associations, recognizing the negligible bargaining power of an individual producer or small groups of producers when selling in a market where most of the business is handled by a few large distributors.¹⁵

Black apparently believed that through inequality of bargaining power producers were in a more or less unfavorable position with respect to the prices they received for milk.¹⁶

Metzger says:

The object which the producers had in mind in forming most of the earlier cooperative-marketing associations was the retail distribution of milk. They felt that the distributor was getting more than his share of the consumer's dollar. By retailing the milk used for fluid consumption and processing the remainder, they reasoned that they would not only receive the same wholesale price that they received under the private-distributor system but would obtain the distributors' share of the profits, which they believed to be exceptionally large. * * * In other cities, particularly the larger ones, where a greater amount of capital was necessary to enter the distributing business, the producers came together in a cooperative organization for the purpose of determining what would be their terms of sale and of obtaining power to negotiate with the distributors as to prices.¹⁷

Other writers express similar ideas:

When we come to the marketing of farm products, especially dairy products, we find that, in order to deal effectively with the agencies of distribution, it becomes necessary to unite into groups that are able to bargain with the buyers of

¹² King, Clyde L., *The Price of Milk*, pp. 134-135.

¹³ A producer who also distributes the milk produced by him.

¹⁴ For example, "When the producer saw that the result of this revolution in dairying, just described, was that his only market for selling his milk to good advantage was the local receiving station of a large milk factory or milk distributor, he began to grow restless concerning the power of these buyers to dictate the price he must accept for his milk. Thanks to American traditions, the producers began to question the fairness of the price they received even though that price was more than they could get, or could have gotten, or had ever received, in any other way. There was a more or less actual monopoly to which the producer must sell his milk. The producer therefore joined with other producers to protect his price, hence the 'Dairymen's Organization' now present in every primary milk market in the United States." King, Clyde L., *The Price of Milk*, p. 135.

¹⁵ "Misuse of bargaining power by some milk buyers in some markets has literally forced milk producers to organize to protect their interests." Bartlett, R. W., *Cooperation in Marketing Dairy Products*, p. 19.

¹⁶ "But some of the gains of cooperative marketing relate more directly to the price making process. Milk distributors, for example, have profited in time past from being able to out bargain the producers, local elevators from local monopoly advantages, and so forth. Perhaps the local cotton market offers the best present example of this." Black, John D., "Economic Possibilities of Cooperation", *American Cooperation*, vol. I, 1925, p. 88.

¹⁷ Metzger, Hutzler, *Cooperative Marketing of Fluid Milk*, Technical Bulletin No. 179, pp. 2-3, U. S. Department of Agriculture.

our products on the basis of equality, if we are to obtain the returns for our products that we are entitled to by the unrestricted law of supply and demand.

It is not natural for the buyer of any commodity to have the whole say as to what he shall pay for the article he buys. Whenever or wherever this takes place, the natural result is that the commodity is bought for less than its real value and the law of supply and demand is interfered with so that the producer or seller becomes impoverished to the point of a destruction of his business.¹⁸

With the development of the market and the widening of the production area, it became impossible to deal with individuals. Then the distributor conducted his transactions with the producer either by mail or representative. The farmer lost his touch with the market and was not familiar with the existing conditions. Whenever such a condition exists, suspicion arises. Such a system also made it easier for the buyer of the product to take an advantage of the seller.¹⁹

There are not more than two real fundamental reasons for the existence of a cooperative marketing association. The first and most important is to secure better prices for the product sold, and the second, to secure permanency of market. Organization alone, no matter how complete, can never do this. No buyer was ever compelled permanently to purchase anything. He only purchases because it is to his best interest to purchase the product offered. If then our fundamental principle is to secure better prices for our product and security of market, this can only be done by our studying the market which we have to supply.²⁰

In a paper delivered before the American Institute of Cooperation in 1927, Clyde L. King reiterated the position set forth in his book that the motive of securing equality of bargaining power was most important in the formulation of milk cooperatives.²¹

Erdmann stresses the inequality of the unorganized producers' position in bargaining with distributors, and shows how cooperative marketing of milk, with special reference to bargaining cooperatives, developed to remedy this situation.²²

The Federal Trade Commission definitely took the position that unsatisfactory market conditions due to certain practices of distributors led fluid milk producers to organize into cooperative marketing associations.²³

Of interest in this connection is the statement of Richard Pattee, prominent in the cooperative movement in New England: "New England farmers will never return to the serfdom under which they struggled in years past, to raise crops, especially dairy products, to sell at prices absolutely dictated by interests whose only object was to buy cheap and sell dear. They demand and will fight for access to their market and a fair return from the reasonable market value of their produce."²⁴

On the other hand, there is some indication that cooperative associations of milk producers were formed in order to secure monopoly advantages. This idea was probably stressed more in the organiza-

¹⁸ Hough, C. E., "Basic and Surplus Milk Classification Policy", American Cooperation, vol. II, 1925, p. 252.

¹⁹ Horner, J. T., "A Comparative Study of Various Fluid Milk Marketing Plans", American Cooperation, vol. II, 1926, p. 21.

²⁰ Slocum, G. W., "Increased Efficiency in a Dairy Cooperative", American Cooperation, vol. II, 1926, pp. 78-79.

²¹ King, Clyde L., "How Dairy Farmers Have Helped Themselves", American Cooperation, vol. II, 1927, p. 158.

²² Erdmann, H. E., The Marketing of Whole Milk, ch. V.

²³ "This interjection of the distributor and dealer between the producer and consumer of fluid milk gave rise to many problems not always satisfactory to the producer, and often placed him at a disadvantage in marketing his product.

"Being out of touch with the consuming market, the individual producer was at the mercy of these middlemen. He was never entirely sure of a market for his milk. Often during the flush season of milk production, if a distributor no longer wanted to use a producer's milk he could and often did refuse his supply on the plea that he could buy cheaper from someone else. Rather than be forced to look for a new market, such producers would very likely accept the low prices offered. Dealers could by playing producers against each other keep prices of milk at unduly low levels. Unsatisfactory market conditions due to such practices by distributors led the producers supplying fluid milk to large consuming centers to organize for self-protection."²⁴—Federal Trade Commission, Cooperative Marketing, S. Doc. No. 95, 70th Cong., 1st sess., p. 27.

²⁴ Pattee, Richard, My Personal Word, p. 57.

tion campaigns in order to sell the idea of cooperation to dairy farmers than as the basis of operating policy once the cooperative was formed. However, there can be little doubt that in many cases farmers joined an association in the belief that they could control prices by controlling the supply.

"Many farmers have joined potato associations, egg and poultry marketing associations, cotton associations, etc., firmly believing that the association would enable them to control prices. * * * Many a red-hot speech has been made to the effect that farmers should get together and fix prices on the basis of cost of production plus a fair profit."²⁵

A. B. Waldauer describes a membership campaign in a small market as follows:

A high-pressure campaign was launched. Leading dairymen promised the rest almost everything to get signatures to contracts. They said that they were signing their "declaration of economic independence." They said that they should organize to "control their own business, and to dictate the price of dairy products."²⁶ The author then shows how the cooperative had a great deal of trouble in carrying out the campaign pledges, and later developed sound business policies and prospered.

Horner puts the matter thus: "In the beginning of farm organization there were two basic thoughts in the minds of leaders. The first was that the most essential thing was to receive a higher price for the product of the farm. The second was that the marketing costs were exorbitant and that the farmer, as well as the consumer, could profit by having these costs reduced. In these early days the problems were attacked without a knowledge of price-making forces, or the economic reasons for the existing marketing agencies. We heard a great deal about the elimination of the middleman and setting prices at a level which would cover cost of production plus a profit. *It seemed that a great many of the leaders thought that prices could be set at any level desired.*"²⁷ [Italics added.]

While there can be little doubt that one of the reasons for the organization of cooperatives was the belief that monopoly gains could be secured, most of the information available indicates that the monopolistic animus in the development of cooperative associations has been greatly overstressed. For example, L. S. Tenney, while stating that the advantages concerning increased prices should be emphasized and every effort be made to carry on a merchandising program such that returns to producers would be increased, pointed out that further advantages are to be secured in stabilizing agriculture and adjusting production to market demand.²⁸ Edrmann points out that cooperatives which endeavored to fix prices without careful consideration of market conditions have had disastrous experiences.²⁹ In the Conference on Economic Principles of Cooperation, held at the American Institute of Cooperation in 1925, considerable attention was given to the matter of monopoly control in cooperative marketing. Charles W. Holman,

²⁵ Gile, B. M., "The Basis of the Cooperative Marketing Program", Cooperative Marketing Journal, May 1923, p. 166.

²⁶ Waldauer, A. B., "The Story of a Typical Small Milk Cooperative", Cooperative Marketing Journal, July 1929, p. 101.

²⁷ Horner, J. T., "Cooperative Marketing of Fluid Milk", The Cooperative Marketing Journal, February 1927, p. 72.

²⁸ Tenney, L. S., "Historical and Interpretative View of Cooperation in the United States", American Cooperation, vol. I, 1925, p. 63.

²⁹ Erdmann, H. E., "Some Economic Fundamentals of Cooperation", American Cooperation, vol. I, 1925, p. 70.

secretary of the National Cooperative Milk Producers' Federation, in this conference took a very decided stand to the effect that it is impossible to enhance farm prices through monopolistic practices in agricultural industries. Dr. J. D. Black commented during the discussion that "cooperative leaders in the country are rather generally satisfied that any curtailment is a difficult undertaking, and the milk producers are sold on that idea."

I. W. Heaps points out that although in the early stages of cooperative marketing the producers believed it would be beneficial to organize to fight somebody or "to compel somebody to do something that he would not otherwise do", and that distributors were antagonistic to producers' cooperatives, both parties found out sooner or later that such a policy could not long endure.³⁰ Mr. Heaps lists the "sound marketing policies" that a cooperative selling fluid milk should follow as: (1) Consider the welfare of the industry from all angles, those of producer, dealer, and consumer alike; (2) provide for producing "as nearly as possible a supply of milk to meet the demands of the market"; (3) hold to a definite selling plan; (4) keep complete records of production and sales; and (5) adopt a definite policy of financing to provide for adequate operating expense and to guarantee farmers against loss.

In regard to the monopolistic aspects of milk cooperatives, Mr. Heaps makes some very pointed remarks, such as "We should all know by this time that any price to producers, based on arbitrary decision, cannot long exist and be profitable to the producers."³¹

J. O. Eastlack, in his paper before the American Institute of Cooperation in 1927, states that "conspicuous, if not paramount, among the considerations that have been urged upon farmers as reasons why they should join cooperative associations has been this question of price. The opinion, more often with hope than confidence, has been repeatedly expressed that when farmers are united in sufficiently large and strong groups they will somehow be able to mold the price-making forces to their advantage. That this is possible because of organization per se is most improbable. What experience has taught, however, is that when producers perform economic services, adapting supply to consumer demand and thereby reduce the loss and risk costs of high surplus and serious shortages, they do influence the price-making forces directly and profoundly to their profit. * * * They (farmers) have come to realize that stable prices determined on the basis of scientific method profit more in the long run than merely higher prices."

B. F. Beach, at that time assistant secretary of the Michigan Milk Producers' Association of Detroit, Mich., in a paper given before the American Institute of Cooperation in 1927, while recognizing the influence of large-scale organization of supply upon the price structure for milk, points out that "the organization cannot sell at a price above that which market conditions will justify." Further, "it is as necessary to know when the price is too low as when it is too high. To a certain degree, when individual competition between producers is removed the law of supply and demand is somewhat affected. With individual competition present during the time of increased demand the price will usually increase. The organization must be well enough

³⁰ Heaps, I. W., "Suggested Set-up for Collective Bargaining of Dairy Cooperatives", American Cooperation, vol. II, 1927, p. 38.

³¹ Ibid., p. 43.

posted to quickly recognize not only opportunities of price increase but increases that would naturally take place without the organization." ³² Here there is a definite recognition of the matter of size as it affects the price structure for milk. Moreover, there is a definite statement that prices cannot be maintained at an artificially high level. For example, in the same paper Mr. Beach states that "the organization cannot keep the fluid territory from expanding. If the association secures the price to which it feels it is entitled it will naturally attract more milk and, as much as we would like to hold the market for ourselves, it seems impossible to do at all times and we must recognize that in some way or another it will expand from time to time." This statement carries the inference that the co-operative must keep its prices in line with competitive prices.

While it would appear that some cooperatives were formed under the belief that prices could be maintained at arbitrary levels through control of supply, on the whole it seems reasonable to conclude that the primary interest of cooperatives, while surely being that of increasing money returns to producers, did not necessarily involve the enhancement of prices to arbitrary levels by monopolistic practices.

On the other hand, there was a rather widespread feeling against the so-called middleman, the idea being that there were too many middlemen, and their profits were too high; in short, all the usual arguments against the middleman. The literature dealing with cooperative marketing bristles with statements that cooperatives can increase efficiency in the marketing system and eliminate unnecessary services, but there is little if any reference made to the proposition that monopoly gains could or should be secured by charging consumers high prices. The major points stressed seem to be that consumers should be charged reasonable prices and that farmers should receive fair prices, depending on market conditions. Much emphasis was placed on the inequality of the bargaining power of producers in negotiations with distributors, and on the belief that cooperatives could render certain services more efficiently, could by joint action promote the use of their product, and the like.

On the whole it seems to be rather generally accepted that one, and perhaps the major, reason for the organization of milk cooperatives was that producers and others interested in the problem thought that producers were not receiving the prices they should receive for their milk because of their weak bargaining position. However, it is not clear in what manner distributors were able to keep the price to producers at artificially low levels on account of the producers' inequality of bargaining power. Did they pay all producers prices that were lower than they should have been, or did they pay some producers low prices, others higher prices, and buy their milk at lower average prices than would have been the case if the market had been competitive? Furthermore, what was the criterion of what prices should have been? If producers had no readily available profitable alternatives and if the distributor were their only outlet, it might have been possible for distributors to purchase each producer's supply at its minimum supply price, i. e., exclusive of rents for intramarginal producers, and thereby have secured his supply at a lower average cost than if there had been several buyers competing for the farmer's milk. ³³

³² Beach, B. F., "What a Fluid Milk Cooperative Can and Cannot Do", *American Cooperation*, vol. II, 1927, p. 195.

³³ See Robinson, Joan, *Economics of Imperfect Competition*, ch. XVIII, for discussion of the general theory involved.

On the other hand, if the producer had alternative enterprises in which he could employ his labor and capital it is difficult to see how the distributor could have purchased milk at less than the supply price for the volume desired, i. e., the price necessary to call forth the desired volume inclusive of rents for intramarginal producers, since any reduction in the price received for milk relative to other products would cause producers to shift to other enterprises and thereby restore the equilibrium. The degree to which distributors were able to practice discrimination in buying would appear to depend upon the strength of the monopoly elements and the availability of alternative enterprises to producers. The more buyers there are, in this case distributors, and the more enterprises in which the producer can employ his labor and capital, the smaller would appear the possibilities of price discrimination in the purchase of milk, at least for any appreciable period of time.

Whatever the reasons for the development of cooperatives, the cooperative marketing of milk has become increasingly important in recent years. According to Metzger, cooperative marketing of fluid milk had gained little permanent foothold prior to 1916, but the earlier efforts at cooperation in marketing fluid milk had laid a strong background of experience which was valuable in the development of the milk cooperative movement which took place largely after 1916.³⁴ At the present time a large portion of the milk in most of the larger milk markets is handled through producer cooperative organizations (handled in the sense that the cooperative arranges sales to distributors).

The extent to which milk in a number of milk markets is sold through cooperatives is indicated in table 10, the figures representing the proportion of the total milk purchased by distributors from members of cooperatives and nonmembers. They do not represent the total volume of milk handled in the market, since the milk produced by producer-distributors is not included in the totals on which the percentages are based, the intention being to indicate the relative importance of the supplies readily available to the distributor, i. e., cooperative members and nonmembers exclusive of producer-distributors. The figures show that in most markets for which data are available, by far the larger portion of the supply is purchased by distributors from members of the cooperative. The proportion of total milk purchased from members of the cooperative varied from 7.0 percent in Tulsa, Okla., to 97.2 percent in Louisville, Ky. In two markets for which data are available the percentage of total milk purchased from cooperatives was less than 50 percent; in four markets it was from 50 to 60 percent; in five markets 60 to 70 percent; in one market 70 to 80 percent; in nine markets 80 to 90 percent; and in five markets above 90 percent. (See fig. 13.) It is rather well recognized that the cooperatives sell a significant portion of the total volume of milk sold to distributors in many markets not included in the figures given above, such as New York City, Philadelphia, Pittsburgh, Chicago, and Milwaukee.

³⁴ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, p. 3. U. S. Department of Agriculture.

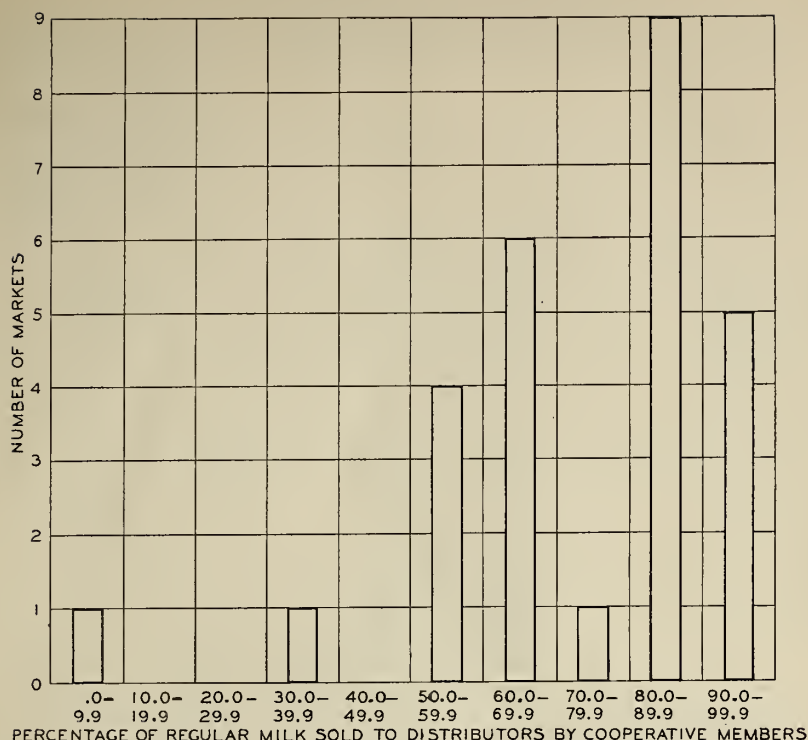


FIGURE 13.—Frequency distribution showing number of markets wherein co-operative members sell specified percentages of the total regular milk supply.

By and large, cooperative associations of milk producers are found to be significant factors in the trade and the structure of the market in most large milk markets as well as in many small ones. It is in the markets where the supply is organized that such devices as the classified-price plan of selling milk to distributors and the several plans of prorating among producers the proceeds of sales to distributors are to be found. These devices will be described and some of their historical background will be discussed in the following sections.

II. DEVELOPMENT OF THE CLASSIFIED-PRICE PLAN OF SELLING MILK TO DISTRIBUTORS

The bargaining cooperatives (see chap. 2, sec. I) usually perform one or more of the following services for their members:

- (1) Act as agents of the producer in bargaining for prices with distributors.
- (2) Guarantee the producer a market for his milk.
- (3) Check the weights and tests of producers' milk.
- (4) Insure the payment to producers of sums owed by distributors.
- (5) Furnish market information.

TABLE 10.—*Proportion of regular¹ milk purchased by distributors from association members and nonmembers in specified markets*

Market	Period covered	Percentage of regular milk purchased by distributors from	
		Association members	Non-members
Alameda County, Calif.	July 1934-June 1935	56.4	43.6
Ann Arbor, Mich.	do	61.3	38.7
Atlanta, Ga.	December 1934-June 1935	51.2	48.8
Battle Creek, Mich.	July 1934-June 1935	95.5	4.5
Boston, Mass.	March 1934-June 1935	88.9	11.1
Detroit, Mich.	April 1934-June 1935	87.2	12.8
Dubuque, Iowa	December 1934-June 1935	74.6	25.4
Evansville, Ind.	March 1934-June 1935	91.5	8.5
Fall River, Mass.	April 1934-June 1935	92.1	7.9
Fort Wayne, Ind.	July 1934-June 1935	53.2	46.8
Grand Rapids, Mich.	do	83.1	16.9
Kalamazoo, Mich.	do	80.9	19.1
Kansas City, Mo.	July 1935-December 1935	92.0	8.0
Leavenworth, Kans.	June 1934-June 1935	62.0	38.0
Los Angeles, Calif.	June 1934-February 1935	60.2	39.8
Louisville, Ky.	June 1934-June 1935	97.2	2.8
Lincoln, Nebr.	April 1934-June 1935	61.9	38.1
Providence, R. I.	April 1934-March 1935	84.4	15.6
Quad Cities, Ill.-Iowa	June 1934-June 1935	86.2	13.8
Richmond, Va.	May 1934-May 1935	57.7	42.3
San Francisco, Calif.	October 1934-June 1935	35.0	65.0
Sioux City, Iowa	April 1934-June 1935	84.2	15.8
St. Louis, Mo.	March 1934-June 1935	63.6	36.4
San Diego, Calif.	February 1935-December 1935	82.9	17.1
Tulsa, Okla.	August 1934-June 1935	7.0	93.0
Wichita, Kans.	March 1934-December 1935	82.0	18.0

¹ This does not include all milk in the market, since producer-distributor milk is excluded from the total on which percentages are based.

Compiled from annual reports of market administrators.

The most important service rendered to members by bargaining cooperatives is that of selling their milk to distributors. The contract between the producer member and the cooperative usually contains a provision whereby the member agrees to sell his milk to the cooperative, or the cooperative is appointed the sole sales agent of the producer for all of his milk and other dairy products, except milk used by the producer for home consumption. The association usually agrees to sell the milk of the member and return to him the proceeds of such sale, subject to certain deductions covering the operating expense of the cooperative.³⁵ Thus the cooperative stands in the position of being the sole sales agent of a large number of producers. While the production of milk is usually in the hands of a large number of producers, the output of each individual producer being very small in relation to the total produced in the market supply area, the sale of such milk is placed in the hands of a single agency.³⁶ Under these conditions the sale of milk becomes in large part a collective action and the formulation of sales and price policies becomes necessary.

The cooperatives, once organized, were immediately faced with the problem of selling all the milk of their members. One writer summarized the problems confronting the cooperatives, when they began operations, in the following statement:

³⁵ See appendix B for copies of the membership agreements of several cooperatives, which may be taken as typical of the membership agreement for a bargaining cooperative.

³⁶ Several cooperatives operate in some markets.

At that time we were confronted with irregular methods of buying, irregular methods of payment, unsatisfactory conditions of weighing or measuring, failure to pay on the part of some buyers, and often irregular and unfair practices on the part of the producers themselves.³⁷

The cooperatives formed during the period of the World War and immediately thereafter, during a period of rapid development of milk bargaining cooperatives,³⁸ apparently bargained with distributors for flat prices for all milk. They were successful for a time in securing flat prices that they considered satisfactory, probably because of the high level of prices for milk used in manufactured dairy products, but this situation did not long continue.³⁹

In some cases where it appears that the flat prices established by the cooperative were too high as compared to the price of milk used in manufactured dairy products, distributors refused to take the milk of all producers supplying them, leaving the producer to seek a market elsewhere.⁴⁰ Horner puts the matter thus:

Quite naturally the flat price was first used because farmers were not familiar with the conditions of the market. It was when distributors began to ask for a lower price because of large amounts of surplus that the producers saw the equity of a use price basis. * * *

There seems to be no reason why milk should be bought on a flat basis.⁴¹

Perhaps the most fundamental difficulty in pricing milk to distributors on a flat-price basis is found in the fact that distributors tend to vary widely as regards the proportion of milk sold in each use, coupled with the additional fact that, in a market sufficiently large, differences in transportation costs per unit of milk and the product equivalent of such unit of milk operate so that the market tends to be zoned and milk used for fluid milk must command a price sufficiently higher than that of the cream equivalent of a unit of milk to cover the higher cost of transporting milk in fluid form rather than as cream or other product form.⁴²

It is rather well recognized that there are marked variations among distributors with respect to the proportion of their total sales represented by sales of milk in fluid form. An example of this type of variation between distributors is set forth in table 11, which shows the number of distributors in specified markets classified according to the proportion of their total milk sales that was sold in fluid form. In the

³⁷ Allebach, H. D., "Aims and Methods of Collective Bargaining", American Cooperation, 1928, vol. II, p. 185.

³⁸ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, pp. 17-21, U. S. Department of Agriculture.

³⁹ "The heavy European demand greatly increased the price of condensed and evaporated milk during the World War. Fluid-milk prices lagged behind prices for the evaporated products from August 1916 to April 1917. With the rapidly increasing demand for milk and other dairy products from 1917 to 1920, marketing associations for the most part had little trouble in obtaining high returns under the flat-price system; but it finally became evident that cessation of the war-time demand for condensed and evaporated milk had left a large volume of these products for which there was no profitable outlet. * * * With the loss of profitable outlets for these products, a few manufacturers closed their plants, and those that continued to operate were enabled to do so only by paying producers greatly reduced prices. As a result, the producers * * * could not force a rise in the flat-price level while the total demand was below the total supply. Distributors having a relatively large volume of surplus also became dissatisfied with the flat-price system because it failed to recognize that a large part of their volume had a market value below the average on which the flat price was based." Bartlett, R. W., Cooperation in Marketing Dairy Products, ch. I, pp. 11-12.

⁴⁰ "Like other associations, as soon as we got started in 1917, we found that milk producers were in the habit of allowing production to become very uneven and out of balance with demands. The supply would often be nearly double the demand and at other times of the same year the supply did not equal the demand. This situation was very disastrous and many producers had no market at some seasons of the year." Hough, C. E., "Basic and Surplus Milk Classification Policy", American Cooperation, 1925, vol. II, p. 255.

⁴¹ Horner, J. T., "A Comparative Study of Various Fluid Milk Marketing Plans", American Cooperation, 1926, vol. II, p. 24.

⁴² See ch. 4. Differences in sanitation regulations for milk and the several products also operate to increase the price of fluid milk relative to that of milk used for other purposes, since milk used as fluid milk usually has to meet more stringent regulations than milk produced for use in product form.

Boston market the proportion fluid-milk sales are of total sales varies for particular distributors from slightly above zero to over 90 percent, with six distributors falling in the former category and four in the latter. Twenty-one distributors sell over 50 percent while 15 sell less than 50 percent of their total sales in fluid form. In St. Louis, Mo., Phoenix, Ariz., Richmond, Va., and San Diego, Calif., the range is not so great as in Boston but nevertheless wide variations exist.

TABLE 11.—*Number of distributors in specified markets, classified according to the proportion of their total sales represented by class I milk*

Market	Period covered	Number of distributors who utilized specified percentage of their total purchases in class I									Total number of distributors	
		0-9.9	10.0-19.9	20.0-29.9	30.0-39.9	40.0-49.9	50.0-59.9	60.0-69.9	70.0-79.9	80.0-89.9		90.0-100.0
Boston, Mass.....	March-December 1934 ¹	6	1	3	---	5	7	3	3	4	4	36
St. Louis, Mo.....	July 1934-June 1935.....	---	---	1	1	6	2	---	---	---	---	10
Phoenix, Ariz.....	January-December 1935 ²	---	---	---	---	---	3	1	2	---	---	6
Richmond, Va.....	June 1934-May 1935.....	---	---	---	---	---	2	1	1	---	---	4
San Diego, Calif.....	February-December 1935 ³	---	---	---	---	1	1	1	1	1	1	6

¹ Figures represent percentage of total milk purchased during the period March to December 1934, except for 5 firms, 1 of which reported for the period April to December, 1 August to December, and 3 March to July.

² Figures for 7 months for 1 firm, 8 months for another, others for entire year.

³ Includes 3 distributors who, while having a significant proportion of the total sales in the market, produce a portion of the milk they distribute.

Compiled from annual reports of market administrators.

Cooperatives, in bargaining for flat prices, found that two major difficulties confronted them. These were:

(1) If they bargained for a flat price which would closely approximate the weighted average of the prices that would tend to prevail for milk and the cream and other product equivalent of milk f. o. b. city (and it probably is a reasonable presumption that they would bargain for prices somewhat higher than such weighted average), the distributor who utilized a higher proportion of his receipts in fluid form than the average for the market would be placed at an advantage as compared to the distributor who utilized a lower proportion than the average; and

(2) Under the flat-price system distributors who utilized a significant proportion of their total receipts in product form tended to cut off producers in order to bring their receipts and fluid milk sales into closer adjustment, or refused to bargain with the cooperative.⁴³

Metzger states: "With the coming of the cooperative association to represent the producers, the distributor continued to use the same argument for lower prices that he had used for years: That there was so much surplus he could not profitably dispose of the milk unless the buying price was low. In many markets it was felt that this was often used as an argument to place prices lower than they should be. It

⁴³ For example:

"A dealer under the flat-price system does not want to buy any more milk than he needs to take care of his fluid market. Therefore, when production increases above what he needs for fluid milk, all sorts of methods are used to cut down the supply. The dealer may tell the farmers to hold back a day's supply of milk. The result is that the farmers probably sell the milk elsewhere at still lower prices. Or the dealers neglect to send a sufficient number of cans to take care of the production. The farmer, then, has no method, unless he owns his own cans, of getting the milk into the market under a cut-price sale. It is a shut-back system of handling surplus." Bronson, W. H., "Milk Price Formulas", American Cooperation, 1925, vol. 11, p. 289 "Milk dealers will not agree in advance to buy unlimited quantities of milk, at fluid prices that are satisfactory to producers. They will pay satisfactory prices for the milk which they can sell as fluid milk, if the surplus of producers' shipments can be paid for at prices which represent the value of those surpluses." Hough, C. E., "Basic and Surplus Milk Classification Policy", American Cooperation, 1925, vol. 11, p. 253.

was proposed that the distributor show the producers exactly the quantity he sold for different uses, and that a basis of payment be arranged according to the quantities of milk sold in each of these classes. The plan is usually known as the classification plan and sometimes as the use plan."⁴⁴

In an effort to overcome some of the difficulties of the flat-price system, a system of pricing milk according to the form in which it was sold by distributors gradually developed. Apparently the plan was first used on an extensive scale in Boston, Mass., Washington, D. C., and Philadelphia, Pa., about 1918. Since that time the plan has been instituted in a large number of milk markets. At the present time in most large markets milk is sold to distributors on the basis of a classified-price plan, that is, distributors pay different prices for milk depending upon the form in which they sell it. In some markets a rating plan ⁴⁵ is used in such a manner that it operates not only as a plan for prorating to producers the proceeds of sales to distributors but also as a plan for selling milk to distributors. This is accomplished by setting total ratings at about the same level as fluid milk sales, and shifting producers among distributors so that the milk each distributor is required to pay for at "basic prices" closely approximates each distributor's fluid milk sales. In this manner the rating plan also acts as a classified-price plan under which the distributor is charged different prices for milk sold by him in different forms.

Some indication of the development of the classified-price plan of selling milk to distributors is given in table 12. The historical data readily available are far from complete, particularly with respect to the dates the plan was instituted in various markets and with respect to the number of classes of milk, but it is believed that they are reasonably accurate in indicating the development of classification. The data indicate that in 1918 milk was being sold to distributors on the basis of a classified-price plan in two markets. In 1933, 30 markets were operating under the plan. It should be emphasized that these figures do not represent the total number of markets operating under the plan in the United States, since data are lacking for many markets. However, the figures probably do represent the trend in the development of the plan.⁴⁶

TABLE 12.—*Cumulative total of markets instituting classified-price plans, 1918-33, inclusive*

Year ¹	Number of markets oper- ating under classi- fied-price plan	Year ¹	Number of markets oper- ating under classi- fied-price plan	Year ¹	Number of markets oper- ating under classi- fied-price plan
1918.....	2	1923.....	10	1930.....	19
1919.....	3	1924.....	11	1931.....	24
1920.....	4	1926.....	12	1932.....	28
1921.....	6	1929.....	15	1933.....	30
1922.....	8				

¹ 38 markets operating under the classified-price plan are not included in the table above, on account of lack of data on the date of institution of the plan.

Appendix A, table 56.

⁴⁴ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, p. 48. U. S. Department of Agriculture.

⁴⁵ Commonly called the base-rating, basic-surplus, or base-surplus plan. See sec. III below.

⁴⁶ Additional details are given in appendix A, table 56.

It should be stressed that the classified-price plan is a method of selling milk to distributors, that is, a schedule of prices for classes of milk is set up, such classes being based on the form in which it is used by the distributor.

The second phase of the price-making activities of cooperative associations is the method or methods of returning to producers the proceeds of sales to distributors. These methods are discussed in the following section.

III. METHODS OF PRORATING AMONG PRODUCERS THE PROCEEDS OF SALES TO DISTRIBUTORS

The types of pool plans found in operation in milk markets may be classified roughly into certain broad categories on the basis of the type of prices received by producers, as follows:

1. Weighted average prices for all milk delivered by the producer, calculated on the basis of the utilization of milk by the distributor to whom the producer delivers his milk. This may be called the individual-distributor pool.

2. Weighted average prices for all milk delivered by the producer, calculated on the basis of the utilization of all distributors, in the market. This may be called the market-wide, or straight, pool.

3. Rating and excess prices, the rating price being either the class I or blended class I and class II price for the producer's rating (the rating representing the share of class I or class I and class II sales assigned to the individual producer), and the surplus, or excess, price being the price paid producers for milk delivered in excess of the rating. This type of pricing can be followed if the total sales value on which such prices are based is calculated on the basis of the utilization of the individual distributor or the utilization of all distributors in the market. The former may be called rating⁴⁷ with individual-distributor pool, and the latter, rating with the market-wide pool.

The remainder of this chapter will describe the mechanics of each type of pool set forth above and, in the case of the rating plan or pool, to a brief history of its development. The economics of pooling and some of the problems and practices relative thereto will be discussed in chapter 6.

1. **The individual-distributor pool without rating.**—Few data are available on the extent to which the individual-distributor pool is used in milk markets, or to the date this plan was first used.

The method of determining the price each distributor is required to pay producers delivering milk to him may be presented by the use of certain assumptions and examples relative to receipts, sales, and class prices, as follows:

- (1) All plants are located in the sales area.
- (2) Prices charged distributors f. o. b. city:
 - (a) Class I, \$2 per hundredweight.
 - (b) Class II, \$1.50 per hundredweight.
 - (c) Class III, \$1 per hundredweight.
- (3) Utilization:

Distributor	Class I	Class II	Class III	Total
A.....	500	200	300	1,000
B.....	700	100	200	1,000
C.....	300	300	400	1,000
Total.....	1,500	600	900	3,000

⁴⁷ The term "rating plan" will be used hereafter in this treatise in place of the terms "basic surplus", "base surplus", and "base rating."

(4) Amount distributors are obligated to pay for milk:

Distributor A

Class of milk	Amount of milk	Price per hundred-weight	Total
	<i>Hundred-weight</i>	<i>Dollars</i>	<i>Dollars</i>
I.....	500	2.00	1,000
II.....	200	1.50	300
III.....	300	1.00	300
Total.....	1,000		1,600

Weighted average price to producers, \$1.60 per hundredweight.

Distributor B

Class of milk	Amount of milk	Price per hundred-weight	Total
	<i>Hundred-weight</i>	<i>Dollars</i>	<i>Dollars</i>
I.....	700	2.00	1,400
II.....	100	1.50	150
III.....	200	1.00	200
Total.....	1,000		1,750

Weighted average price to producers, \$1.75 per hundredweight.

Distributor C

Class of milk	Amount of milk	Price per hundred-weight	Total
	<i>Hundred-weight</i>	<i>Dollars</i>	<i>Dollars</i>
I.....	300	2.00	600
II.....	300	1.50	450
III.....	400	1.00	400
Total.....	1,000		1,450

Weighted average price to producers, \$1.45 per hundredweight.

In the example given above, the prices received by producers delivering milk to different distributors, f. o. b. city, range from \$1.45 per hundredweight to \$1.75 per hundredweight, depending upon the utilization by the individual distributor to whom the producer delivers his milk. Thus, although distributors are charged the same price for milk on a use basis, producers do not receive uniform prices on a market-wide basis, the prices received being uniform for milk delivered to a particular distributor, subject, of course, to transportation differentials and the like, but varying for milk delivered to different distributors.

2. **The market-wide or straight pool without rating.**—The figures on receipts, utilization, and prices charged distributors, given in the previous illustration, may also be used to demonstrate the method of arriving at the weighted average price to producers when producers are to be paid prices computed on the basis of market utilization

rather than on the basis of the utilization of the individual distributor. Thus:

- (1) Amount distributors are obligated to pay for milk, entire market:

Class of milk	Amount of milk	Price per hundred-weight	Total
I.....	<i>Hundred-weight</i> 1,500	<i>Dollars</i> 2.00	<i>Dollars</i> 3,000
II.....	600	1.50	900
III.....	900	1.00	900
Total.....	3,000	1.60	4,800

¹ Total milk delivered by producers.

² Weighted average price to producers for all milk, $\$4,800 \div 3,000 \text{ hundredweight} = \$1.60 \text{ per hundredweight}$.

- (2) Determination of weighted average price and payments to producers:

Distributor	Amount distributors are obligated to pay	Amount of milk	Price to producers	Total payment to producers
	<i>Dollars</i>	<i>Hundred-weight</i>	<i>Dollars per hundred-weight</i>	<i>Dollars</i>
A.....	1,600	1,000	1.60	1,600
B.....	1,750	1,000	1.60	1,600
C.....	1,450	1,000	1.60	1,600
Total.....	4,800	3,000	1.60	4,800

The figures given above indicate that under the market-wide or straight-pool plan without rating, some distributors are obligated to pay their producers more and some less per hundredweight than would be the case if producers were paid on the basis of the utilization by the individual distributor to whom the producer delivers his milk. In the previous example distributor A was required to pay the producers delivering to him \$1.60 per hundredweight and, since his utilization is relatively the same as the utilization in the entire market, he pays his producers \$1.60 per hundredweight in this example. On the other hand, distributor B and distributor C paid their producers \$1.75 and \$1.45, respectively, per hundredweight on the basis of their own utilization, but under the market-wide pool arrangement both are required to pay their producers \$1.60 per hundredweight. This necessitates the use of an instrument or mechanism known as the adjustment or equalization account. Thus distributors who are required to pay producers higher weighted average prices than would be the case on the basis of their own utilization obtain through the adjustment account the money to do so, while those who are required to pay their producers less than would be the case on the basis of their own utilization pay such difference into the adjustment account. Thus:

Adjustment accounts of distributors

Distributor A		Distributor B		Distributor C	
Debit	Credit	Debit	Credit	Debit	Credit
\$1,600	\$1,600	\$1,750	\$1,600 150	\$1,450 150	\$1,600
1,600	1,600	1,750	1,750	1,600	1,600

Each distributor is debited with the amount he is obligated to pay for milk. He is credited with the amount he pays producers at the blended or weighted average price. The difference is paid to or by the agency operating the adjustment account.

It should be noted that the total cost of milk to each distributor is the same regardless of whether the proceeds of sales from the pool are being prorated among producers on the basis of an individual-distributor pool or of a straight pool.

3. The market-wide or straight pool with rating.—As was pointed out before, producers operating under a rating plan receive two prices for their milk, one price being applicable to the quantity assigned the producer, his rating, which represents the producer's allotted share of the fluid milk or fluid milk and cream sales, the other price being applicable to the quantity delivered by the producer in excess of his rating. The mechanics of the determination of rating and excess prices to producers are illustrated below. The figures previously assumed for sales, prices, and total deliveries may be used in this connection. It is further assumed that the established and delivered ratings⁴⁸ of producers supplying the market are as follows:

Established and delivered ratings of producers supplying the market

Distributor	Total established ratings	Total delivered ratings	Total milk delivered	Excess over delivered ratings
	<i>Hundred-weight</i>	<i>Hundred-weight</i>	<i>Hundred-weight</i>	<i>Hundred-weight</i>
A.....	800	700	1,000	300
B.....	900	800	1,000	200
C.....	700	500	1,000	500
Total.....	2,400	2,000	3,000	1,000

It should be noted that delivered ratings at each plant are shown to be less than the established ratings, yet each plant has a substantial proportion of surplus milk (excess over delivered ratings). This is not an unusual situation in markets operating under the rating plan, because some farmers do not deliver the full amount of their ratings while other farmers deliver milk in excess of their ratings.

Payments to producers for milk delivered in excess of ratings are as follows:

Distributor	Excess milk	Price to producers ¹	Payment to producers
	<i>Hundred-weight</i>	<i>Dollar per hundred-weight</i>	<i>Dollars</i>
A.....	300	1	300
B.....	200	1	200
C.....	500	1	500
Total.....	1,000	-----	1,000

¹ Price of manufacturing or class III milk.

⁴⁸ The amount of milk delivered not in excess of established base.

The amount of money available for payment for delivered ratings is as follows (the gross value of sales is the same as in the previous examples):

Distributor	Amount distributors are obligated to pay	Payment for excess over delivered ratings	Amount available for delivered ratings
A-----	\$1,600	\$300	\$1,300
B-----	1,750	200	1,550
C-----	1,450	500	950
Total-----	4,800	1,000	3,800

The blended price payable for delivered ratings=\$1.90 per hundredweight ($\$3,800.00 \div 2,000$ hundredweight=\$1.90).

This plan also necessitates the use of an adjustment account (described in the preceding example). The operation of the adjustment account is as follows:

Distributor A		Distributor B		Distributor C	
Debit	Credit	Debit	Credit	Debit	Credit
\$1,600	\$300	\$1,750	\$200	\$1,450	\$500
-----	1,330	-----	1,520	-----	950
30		-----	30	-----	
1,630	1,630	1,750	1,750	1,450	1,450

Each distributor is debited with the amount he is obligated to pay for milk. He is credited with the amount he pays producers for excess milk, and with the amount he pays producers for delivered ratings. The balance is paid to or by the organization operating the pool.

4. Historical sketch of the development of the rating plan.—It is indeed difficult to piece together the conflicting statements found regarding the reasons for the development of the rating plan. The reasons given include control of production in the sense of limitation of total production, evening up the supply (seasonal production control), pricing milk to producers on the basis of evenness of supply (allocating the surplus to those who produced it), and other reasons, some of which indicate that the plan was instituted primarily for the purpose of pricing milk to distributors and, secondarily, for the purpose of prorating among producers the proceeds of sales to distributors. Black states that the plan was invented primarily for the purpose of evening out production and reducing the seasonal surplus.⁴⁹

I. W. Heaps states: "Soon we found that, when we got a price that suited our fancy at all, we were getting a lot more milk produced than we had a market for as fluid milk.

"We then had to provide some means to even up the supply. In the fall of 1918 we adopted the plan of paying basic price for all the milk produced in the months of October, November, and December.

⁴⁹ "Strangely enough, it was invented as a scheme for inducing members to even out their production and thus reduce the troublesome seasonal surplus coming to market." Black, J. D., *The Dairy Industry and the AAA*, ch. VII, pp. 196-197.

The quantity produced in those months was the basic amount, for which the farmer would receive a basic price for the balance of the year. But we still had that trouble with the surplus. * * * The basic quantity also got us into a lot of trouble because the farmers took advantage of it. It was not many years until they had their herds adjusted so that the majority of their cows freshened in the fall. There was a tremendous production of milk right at the time of the year when there was not a demand for cream and byproducts, and when fluid milk brought the highest price."⁵⁰ Mr. Heaps then shows how they adjusted their rating arrangements and states that the adjustments resulted in a decrease in production.

C. E. Hough, in discussing the rating plan of the Connecticut Milk Producers' Association, leaves the inference that its rating plan was designed as a means of selling milk to distributors as well as a means of prorating among producers the proceeds of sales to distributors in such manner that evenness in production was encouraged.⁵¹ Its plan, at the time this discussion took place, apparently was an individual-distributor pool with rating.

H. D. Allebach, in discussing the rating plan employed in the Philadelphia market, pointed out that the market was short of milk in October, November, and December, and had a surplus in the summer time. Further, the distributors purchasing their supplies from the cooperative went "outside" in the period of low production to get their milk. In order to handle this situation a rating plan was developed whereby the producers' average production in October, November, and December became their "basic", for which they received the negotiated rating price.⁵²

It should be noted in this connection that the rating plan in Philadelphia was used also as a method of selling milk to distributors. Although data are not at hand to determine the extent to which the rating plan was used as a method of selling milk to distributors, it appears reasonable to believe that this was in reality one of its major objectives when the plan first was being developed. The rating plan may be so administered as to operate practically the same as a classified-price plan. As was pointed out above, the classified-price plan is one whereby distributors are charged a schedule of prices for milk depending upon the form in which such milk is sold by distributors, that is, as fluid milk, fluid cream, butter, ice cream, etc. If, then, total ratings are established at a level approximately equal to fluid-milk sales and if the cooperative shifts producers among distributors so that the ratings of producers delivering milk to each distributor are approximately equal to such distributor's fluid-milk sales, the plan operates about the same as a classified-price plan of selling milk to distributors, as well as a method of prorating among producers the proceeds of sales to distributors.

⁵⁰ Statement of I. W. Heaps on "Milk Classification and Prices", American Cooperation, vol. II, pp. 315-316, 1925.

⁵¹ "They (distributors) are willing to handle all of the milk of our members, all of the time, providing our production is equal to their needs, all of the time, and providing we do not ask them to accept large surpluses of milk, or do not ask them to purchase at as high a price as we are obliged to ask for fluid milk to cover our production costs. * * *

Milk dealers will not agree in advance to buy unlimited quantities of milk, at fluid prices that are satisfactory to producers. They will pay satisfactory prices for the milk which they can sell as fluid milk, if the surplus of producers' shipments can be paid for at prices which represent the volume of those surpluses. To meet this situation we execute contracts between groups of our members and individual milk dealers. We exercise the right to sell the milk of a group to each dealer that is as close as possible to the needs of that dealer." Hough, C. E., "Basic and Surplus Milk Classification Policy", American Cooperation, vol. II, p. 253, 1925.

⁵² Allebach, H. D., "The Conference Method of Determining Price", American Cooperation, vol. II, p. 282.

As was noted previously, the reasons given for the origin and development of the rating plan are more or less obscure. Perhaps the plan had its beginning partly in an effort to develop a scheme for equitably apportioning the surplus. Numerous quotations given in the preceding sections of this chapter refer to the extreme difficulty the early producer organizations encountered, because of the surplus, in securing what they considered proper prices for their milk. Encountered with this argument by distributors the cooperatives bargained for different prices for milk according to use, selling the milk used by distributors for distribution as fluid milk at one price and the milk used by distributors in forms other than fluid milk at prices which would enable distributors to utilize such milk in competition with other dairy products on the market. Thus the price scheme was such that each enterprise was placed on its own feet, as it were, in the matter of the cost of the raw material. Since the prices received for such surplus milk were, and for that matter, still are considerably below the prices negotiated for milk used as fluid milk, it follows that the fluid-milk use is the preferred use. However, producers differ markedly with respect to the seasonality of their production.⁵³ Some produce a fairly constant volume of milk throughout the year while others produce a quantity that varies markedly from season to season. The low period of production for most milk markets comes in the fall months, and production within the regular supply area during this period is often barely sufficient to meet fluid-milk requirements. Fluid-milk sales, however, show relatively slight variations from season to season. Hence if the volume of milk produced within the usual supply area during the season of low production is just sufficient to cover fluid-milk sales plus the operating reserve, it follows that during the season of flush production there will be a considerable volume of milk produced in excess of fluid-milk sales, and this excess will have to be sold at the lower surplus or excess prices.⁵⁴ From this it follows that, if the price of milk sold in different uses is not reflected back to producers on a use basis but on a weighted average price basis, there is considerable seasonal variation in the prices received by all producers, on account of the different proportions of excess milk at different seasons of the year. But not all producers produce this "excess." The even producer is producing milk practically in accordance with the needs of the fluid-milk trade while the uneven producer may be considered to be producing the surplus in this connection. Hence, according to this line of argument, the surplus price should be received by those who produce the surplus, if sharing in the fluid-milk market is to be equitable.

Dr. Black states: "It [the rating plan] is now recognized as primarily a method of paying more regular producers equitably for their surplus milk; of restoring to them the higher average annual prices which were taken away when pooling was adopted. It accomplishes its objective of evening out production, not by subsidizing such production but by paying what it is worth."⁵⁵

Whatever the reasons for its development, the fact remains that the rating plan, or variations thereof, is in operation in many milk markets at the present time. Apparently the plan was first instituted on an extensive scale in the Baltimore, Md., market about 1918 and

⁵³ See ch. 3, sec. II.

⁵⁴ This point is developed in more detail in ch. 3, sec. III.

⁵⁵ Black, John D., *The Dairy Industry and the AAA*, ch. VII, p. 197.

in the Philadelphia, Pa., market a year later,⁵⁶ although Black reports that a form of rating plan was used in the Boston market during the period 1901 to 1905.⁵⁷

Table 13 gives a partial list of the markets that have at one time or another operated under rating plans, and the approximate date of institution of the plan in these markets. Many of these markets are still operating under the plan. These figures indicate that there has been a marked increase in the number of markets operating under rating plans in recent years, and although these data by no means represent complete coverage of milk markets they are probably indicative of the trend.

TABLE 13.—*Partial list of milk markets that have operated with rating plans¹ as a part of the market structure, and approximate dates of institution of the rating plan in these markets*

Market	State	Year rating plan was established (approximate)
Baltimore.....	Maryland.....	1918.
Philadelphia.....	Pennsylvania.....	1919.
Detroit.....	Michigan.....	1923. ²
Newport.....	Rhode Island.....	1923.
Ann Arbor.....	Michigan.....	1923. ³
Grand Rapids.....	do.....	1923.
Washington.....	District of Columbia.....	Mar. 1, 1924.
Los Angeles.....	California.....	February 1926. ⁴
Saginaw.....	Michigan.....	1927.
Chicago.....	Illinois.....	1929.
Louisville.....	Kentucky.....	1929. ⁵
Savannah.....	Georgia.....	1929.
Des Moines.....	Iowa.....	1930. ⁶
St. Louis.....	Missouri.....	1930. ⁷
Boston.....	Massachusetts.....	1930. ⁸
Richmond.....	Virginia.....	1930.
Alameda County.....	California.....	1930.
Lansing.....	Michigan.....	1930. ⁹
Muskegon.....	do.....	1930.
San Francisco.....	California.....	1930.
Greater Kansas City.....	Missouri-Kansas.....	1931.
Providence.....	Rhode Island.....	1931.
New Bedford.....	Massachusetts.....	1931.
Fall River.....	do.....	1931.
Evansville.....	Indiana.....	1932.
Atlanta.....	Georgia.....	1932. ¹⁰
San Diego.....	California.....	1932.
Quad Cities.....	Iowa-Illinois.....	July 1933. ¹¹
Battle Creek.....	Michigan.....	September 1933.
Kalamazoo.....	do.....	1933.
Omaha-Council Bluffs.....	Nebraska-Iowa.....	Feb. 23, 1934. ¹²
Lincoln.....	Nebraska.....	1934.
Wichita.....	Kansas.....	Mar. 17, 1934. ¹³
Leavenworth.....	do.....	May 16, 1934.
Bay City.....	Michigan.....	May 3, 1934.
Flint.....	do.....	May 3, 1934.
Port Huron.....	do.....	July 1, 1934. ¹⁴

¹ Sponsored in every case by a cooperative association of producers in the market.

² Horner, J. T., The Detroit Milk Market, Special Bulletin No. 170, Michigan State College.

³ Abandoned after several years. Reestablished in 1930.

⁴ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, U. S. Department of Agriculture.

⁵ Introduced about 1929 but discontinued in fall of 1930. Reestablished in later years.

⁶ Base-surplus plan dropped from Federal license Dec. 5, 1934.

⁷ Base-surplus plan discontinued under Federal license as of Nov. 16, 1934.

⁸ There had been in effect for several years another plan prior to the present one.

⁹ Operated only temporarily. Reestablished in June 1934.

¹⁰ Two earlier rating plans discontinued. Reestablished in February 1934.

¹¹ Abandoned in March 1934. Added to Federal license Sept. 1, 1934.

¹² Apparently no base-surplus plan prior to the Federal license.

¹³ No base-surplus plan prior to Federal license.

¹⁴ The base-surplus plan had been used over a small part of the market for several years previously.

Compiled in most cases from transcripts of hearings for proposed marketing agreements for milk.

¹⁵ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, U. S. Department of Agriculture, May 1930, p. 31.

¹⁶ Black, John D., *op. cit.*

The preceding sections of this chapter have been devoted to a short description of the origin, development, and price-making activities of cooperative associations of milk producers, the classified-price plan of selling milk to distributors, the various methods of prorating among producers the proceeds of sales to distributors, and some indication of the volume of milk handled or controlled by cooperatives in relation to the market total in markets for which data are available. The remaining section of this chapter will deal with the size of distributors.

IV. SIZE OF BUSINESS OF INDIVIDUAL DISTRIBUTORS

The licenses and orders issued by the Federal Government under authority of the Agricultural Marketing Agreement Act require, among other things, that the milk distributor report his sales of milk, by classes, to the market administrator.⁵⁸ These data are necessary, of course, in any program which fixes minimum prices of milk according to use, but they may also be used to indicate what the situation is with respect to size of business, seasonality of sales, etc., in many markets for which such data have rarely, if ever, been available on a market-wide basis.

Data pertaining to five markets, located in different sections of the country and operating under widely different conditions, were analyzed for the purpose of ascertaining facts as to the size of business of milk distributors in these markets. The sales of class I milk of individual distributors are expressed as a percentage of the market total and summarized for the markets of Boston, Mass., St. Louis, Mo., Phoenix, Ariz., San Diego, Calif., and Richmond, Va., in table 14. The figures show that, in the markets for which data are presented, by far the larger portion of the total class I sales⁵⁹ in the market⁶⁰ are made by only a few distributors. In Boston the three largest distributors had 63.2 percent of the total class I business and the nine largest had 91.4 percent of the total. The same situation holds true in the other markets, the four largest distributors having 68.7 percent, and the three largest distributors having 84.4 percent, 63.0 percent, and 89.9 percent of the total fluid-milk sales in St. Louis, Phoenix, San Diego, and Richmond, respectively. While the figures for other markets operating under Federal licenses or orders are not included in this treatise, such figures show practically the same results. On the whole it appears reasonable to conclude that in many milk markets by far the larger portion of the fluid-milk trade is handled by a few large distributors.⁶¹

⁵⁸ The market administrator is the person in charge of the details of administration of the license or order in markets operating under Federal programs.

⁵⁹ Milk sold by distributors as fluid milk.

⁶⁰ The figures given do not represent total sales in the market, since a small percentage of the total volume is not reported to the market administrator. However, for all practical purposes the figures may be taken as indicative of the size of business of distributors.

⁶¹ See ch. 4, sec. III, for a discussion of the importance of this factor with respect to the structure of milk prices.

TABLE 14.—*Proportion of total class I milk sales in the market, handled by distributors falling within specified size groups in 5 markets*

Size group	Proportion of total class I milk sales handled by distributors in specified size groups				
	Boston, Mass. ¹	St. Louis, Mo. ²	Phoenix, Ariz. ³	San Diego, Calif. ⁴	Richmond, Va. ⁵
3 largest-----	<i>Percent</i> 63.2	<i>Percent</i> 63.7	<i>Percent</i> 84.4	<i>Percent</i> 63.0	<i>Percent</i> 89.9
6 largest-----	80.5	76.6	97.7	68.9	(⁶)
9 largest-----	88.8	80.8	(⁶)	70.1	-----

¹ Period covered, Mar. 16-Dec. 30, 1934.² Period covered, Jan. 1-Dec. 31, 1936. Figures refer to volumes handled by 4 largest, 8 largest, and 12 largest distributors.³ Period covered, January-December 1935.⁴ Period covered, February-April 1935.⁵ Period covered, June 1934-May 1935.⁶ Remainder of total volume handled by producer-distributors.

Compiled from reports of the market administrators.

V. SUMMARY

The facts and considerations developed in this chapter may be summarized as follows:

(1) In most large milk markets a significant portion of the producers are organized into cooperative associations whose main purpose is to bargain for prices and terms of sale to distributors. Under these circumstances, although the production of milk is carried on by numerous producers, the sale of such milk to distributors is accomplished by a unit, the cooperative association.

(2) The fluid-milk cooperatives have developed the classified-price plan of selling milk to distributors, whereby distributors are charged a schedule of prices for milk that depends upon the form in which it is utilized by them, i. e., as fluid milk, fluid cream, butter, evaporated milk, etc.

(3) In many milk markets, especially those where a strong cooperative association of producers is in existence, the proceeds of sales to distributors are prorated among producers in several ways, such as (1) the individual-distributor pool with or without rating, (2) the market-wide pool without rating, and (3) the market-wide pool with rating.

(4) In many milk markets, especially the larger ones, a large part of the business of milk distribution is concentrated in the hands of a few large distributors who handle by far the larger portion of the business in the market, the remainder being handled by a varying number of small distributors.

The next chapter of this treatise will be devoted to the development of certain facts and considerations regarding the nature of the demand for milk, the seasonal course of milk receipts by distributors from producers, the seasonal and daily variation in sales of milk to consumers, and other related information.

CHAPTER 3

SOME FACTS AND CONSIDERATIONS REGARDING THE DEMAND FOR MILK AND THE SEASONAL COURSE OF SUPPLIES IN SELECTED MILK MARKETS

I. THE NATURE OF THE DEMAND FOR MILK

1. Consumers' response to changes in the price of milk.—Statistical investigations, in general, have indicated that the demand for fluid milk by consumers is very inelastic; that is, that the change in the quantities of milk taken, following increases or decreases in price, is small relative to the change in price. Two published studies⁶² for the Chicago and New York markets indicate that, during the period covered by the studies, when consumers recognized the necessity for changes in the retail price of milk, a 1-cent change in the retail price per quart had a slight immediate effect on sales and that this effect was considerably diminished after 5 or 6 weeks.

Evidence concerning the influence of price changes upon milk sales has been obtained from an examination of the milk sales by distributors purchasing from cooperative associations in Baltimore, Md., Boston, Mass., and the Twin Cities, Minn. In these cities the cooperative associations have a considerable share of the business of the market, and changes in their sales are no doubt fairly representative of the market as a whole. These data were analyzed by comparing the sales in the calendar months preceding the price change with the sales in the calendar month following the price change,⁶³ after adjusting for the influence of the average seasonal variation in sales. Indices of seasonal variation were calculated by the median-link-relative method, omitting the months in which price changes occurred. The results of the analysis are given in tables 15-17.

TABLE 15.—*Changes in sales of fluid milk following changes in retail prices, Baltimore, Md., September 1926 to May 1931, inclusive*

Month	Sales (30-day month basis) ¹	Index of seasonal variation ²	Seasonally adjusted sales ³	Retail prices per quart ⁴
	<i>1,000 gallons</i>	<i>Percent</i>	<i>1,000 gallons</i>	<i>Cents</i>
September 1926.....	1,544	100.5	1,536	13
November 1926.....	1,510	101.0	1,495	14
Percent change.....			-2.7	+7.7
March 1931.....	1,431	100.2	1,428	14
May 1931.....	1,462	101.4	1,442	12
Percent change.....			+1.0	-14.3
Average percent change ⁵			1.8	11.0

¹ Appendix A, table 57.

³ Computed from columns 1 and 2.

² Appendix A, table 58.

⁴ Appendix A, table 59.

⁵ Represents average of percentage changes without regard to signs.

⁶² Ross, H. A., *The Marketing of Milk in the Chicago Dairy District*, Illinois Agricultural Experiment Station Bulletin No. 269, pp. 503-510, 1925, and Ross, H. A., *Some Factors Affecting the Demand for Milk and Cream in Metropolitan Area of New York*, Technical Bulletin No. 73, U. S. Department of Agriculture.

⁶³ In some cases prices changed each month for 2 or more consecutive months. In these cases the sales in the calendar months preceding the price change were compared to sales in the calendar month following the last month in the series of consecutive monthly price changes.

TABLE 16.—Changes in sales of fluid milk following changes in retail prices, Boston, Mass., March 1922 to September 1931

	Sales (30-day month basis) ¹	Index of seasonal variation ²	Season- ally ad- justed sales ³	Retail prices per quart ⁴		Sales (30-day month basis) ¹	Index of seasonal variation ²	Season- ally ad- justed sales ³	Retail prices per quart ⁴
	Million pounds	Per- cent	Million pounds	Cents		Million pounds	Per- cent	Million pounds	Cents
March 1922.....	22.0	98.6	22.3	13.5	October 1926.....	28.4	28.3	14.5	
May 1922.....	22.8	99.5	22.9	12.5	February 1927.....	27.8	100.4	28.5	14
Percent change.....			+2.7	-7.4	Percent change.....		+7	-3.4	
June 1922.....	23.9	102.8	23.2	12.5	June 1927.....	29.0	102.8	28.2	14
August 1922.....	22.9	103.1	22.2	13.5	March 1928.....	29.5	98.6	29.9	15.5
Percent change.....			-4.3	+8.0	Percent change.....		+6.0	+10.7	
March 1923.....	23.0	98.6	23.3	14.5	March 1928.....	29.5	98.6	29.9	15.5
May 1923.....	23.6	99.5	23.7	13.5	May 1928.....	29.5	99.5	29.6	14.5
Percent change.....			+1.7	-6.9	Percent change.....		-1.0	-6.5	
June 1923.....	25.6	102.8	24.9	13.5	June 1928.....	29.9	102.8	29.1	14.5
September 1923.....	23.2	100.5	23.1	14.5	September 1928.....	29.4	100.5	29.3	15.5
Percent change.....			-7.2	+7.4	Percent change.....		+7	+6.9	
October 1923.....	23.6	100.4	23.5	14.5	November 1930.....	29.1	100.7	28.9	15.5
May 1924.....	25.2	99.5	25.3	12	March 1931.....	30.2	98.6	30.6	12.5
Percent change.....			+7.7	-17.2	Percent change.....		+5.9	-19.4	
June 1924.....	26.2	102.8	25.5	12	July 1931.....	31.6	106.8	29.6	12.5
October 1924.....	24.1	100.4	24.0	14.5	September 1931.....	30.1	100.5	30.0	13.5
Percent change.....			-5.9	+20.8	Percent change.....		+1.3	+8.0	
February 1925.....	24.6	97.6	25.2	14.5	Average percentage change ⁵			-5.8	+11.9
April 1925.....	25.2	97.2	25.9	13.5	Average percentage change ⁶			+3.8	-9.3
Percent change.....			+2.8	-6.9	Average percentage change ⁷			4.5	10.2
April 1925.....	25.2	97.2	25.9	13.5					
June 1925.....	28.0	102.8	27.2	13					
Percent change.....			+5.0	-3.7					
June 1925.....	29.0	102.8	27.2	13					
September 1925.....	25.7	100.5	25.6	14.5					
Percent change.....			-5.9	+11.5					

¹ Appendix A, table 60.² Appendix A, table 58.³ Represents average of percentage increases in price that were associated with percentage decreases in sales.⁴ Represents average of percentage decreases in price that were associated with percentage increases in sales.⁵ Represents average of percentage changes in price or in sales that were associated with opposite changes in sales or in price, without regard to signs.

TABLE 17.—Changes in sales of fluid milk following changes in retail prices, Twin Cities, Minn., March 1924 to August 1932

	Sales (30-day month basis) ¹	Index of seasonal variation ²	Season- ally ad- justed sales ³	Retail prices per quart ⁴		Sales (30-day month basis) ¹	Index of seasonal variation ²	Season- ally ad- justed sales ³	Retail prices per quart ⁴
	1,000 pounds	Per- cent	1,000 pounds	Cents		1,000 pounds	Per- cent	1,000 pounds	Cents
March 1924.....	11,279	101.4	11,123	11.5	October 1930.....	13,543	102.5	13,213	11
May 1924.....	11,720	99.5	11,779	10	January 1931.....	12,961	98.8	13,118	10
Percent change.....			+5.9	-13.0	Percent change.....			-7	-9.1
July 1924.....	11,871	98.0	12,113	10	November 1931.....	12,724	101.7	12,511	10
September 1924.....	11,788	100.1	11,776	11	January 1932.....	12,203	98.8	12,351	9.5
Percent change.....			-2.8	+10.0	Percent change.....			-1.3	-5.0
August 1925.....	12,570	99.1	12,684	11	January 1932.....	12,203	98.8	12,351	9.5
October 1925.....	12,492	102.5	12,187	12	March 1932.....	12,543	101.4	12,361	8.5
Percent change.....			-3.9	+9.1	Percent change.....			+1	-10.5
December 1925.....	11,861	98.0	12,103	12	June 1932.....	12,534	98.1	12,777	8.5
March 1926.....	12,246	101.4	12,077	11	August 1932.....	12,717	99.1	12,832	8
Percent change.....			-2	-8.3	Percent change.....			+4	-6.5
August 1927.....	12,111	99.1	12,221	11	Average percentage change ⁵			-3.3	+9.6
November 1927.....	12,608	101.7	12,397	12	Average percentage change ⁶			+2.0	-9.5
Percent change.....			+1.4	+9.1	Average percentage change ⁷			2.4	9.5
December 1929.....	12,980	98.0	13,245	12					
February 1930.....	13,571	101.0	13,437	11					
Percent change.....			+1.4	-8.3					

¹ Appendix A, table 62.² Appendix A, table 58.³ Represents average of percentage increases in price that were associated with percentage decreases in sales.⁴ Represents average of percentage decreases in price that were associated with percentage increases in sales.⁵ Represents average of percentage changes in price or in sales that were associated with opposite changes in sales or in price, without regard to signs.

Examination of the data shows that a change in price usually results in an opposite but much smaller change in sales. In Boston there were 15 price changes (8 decreases and 7 increases) during the period March 1922 to September 1931; in Baltimore there were only 2 changes, 1 decrease and 1 increase; and in the Twin Cities market there were 7 decreases and 3 increases. Changes in sales in Boston were directly associated with changes in prices in four cases instead of being inversely associated as would have been the case if other conditions had remained the same. These four exceptions followed price changes occurring in July 1927, April 1928, July 1929, and August 1931; and there were four exceptions in the Twin Cities market, in March 1926, November 1927, January 1931, and March 1932. These unusual cases occurred in periods when business conditions were changing rapidly, and probably are explained by changes in these conditions.

Data contained in the reports of the market administrators for the various markets operating under Federal licenses also provide some indication of the consumer response to price changes in these markets. Only those markets where class I milk was defined as milk sold or distributed for consumption as milk, and where the size of the sales area has remained constant, are considered. These data have been received for such a short period that it was impossible to compute a satisfactory index of seasonal variation and to adjust sales for seasonal variation, except where other sales data from the same market were available for earlier periods.

The results of this latter study must be interpreted with some caution since there are other factors than price which influence sales. Sudden changes in temperature influence the volume of milk sold. There is a seasonal variation in total fluid sales, which is in part influenced by the vacation movement, and this in turn is affected by the prosperity of the community. Moreover, in a period of several months in recent years business conditions and consumer incomes have changed materially. These considerations limit somewhat the significance of the results of the study. However, it is important to note that the results supplement the results obtained in the other studies, showing that changes in price are associated with opposite changes in fluid-milk sales, and that the changes in price are relatively much greater than the changes in sales. The data are shown in table 18, and indicate that an average change of 3.4 percent in sales is associated with an average opposite change of 12.3 percent in price.

It appears from the foregoing that the demand for milk is highly inelastic, especially when retail-price changes are relatively small. When price changes are relatively large, it is possible that the change in consumption may be somewhat greater than when the changes in the retail price are relatively small, although the change in sales is probably less than directly proportional to the change in price. However, the data that are available regarding this point are inconclusive.⁶⁴

⁶⁴ See also Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, Technical Bulletin No. 73, U. S. Department of Agriculture.

TABLE 18.—*Summary of changes in sales and in prices in specified cities*

Sales area and period	Estimated average daily class I sales	Retail delivery price per quart
	<i>Pounds</i>	<i>Cents</i>
Boston:		
April 1934 to September 1934.....	1,618,000	11
October 1934 to February 1935.....	1,592,000	12
Percentage change.....	-1.6	+9.1
March 1935 and April 1935.....	1,576,000	13
Percentage change.....	-1.0	+8.3
Detroit:		
April 1934 to June 1934.....	¹ 1,221,000	10
July 1934 to February 1935.....	¹ 1,167,000	11
Percentage change.....	-4.4	+10.0
March 1935.....	¹ 1,153,000	12
Percentage change.....	-1.2	+9.1
Evansville:		
May 1934 to September 1934.....	43,764	9
October 1934 to March 1935.....	41,635	9.5
Percentage change.....	-4.9	+5.6
Grand Rapids:		
August 1934 and September 1934.....	127,123	9
October 1934 to March 1935.....	127,208	10
Percentage change.....	0	+11.1
Kalamazoo:		
July 1934 to November 1934.....	36,733	10
December 1934 to February 1935.....	40,720	8
Percentage change.....	+10.9	-20.0
March 1935.....	39,397	10
Percentage change.....	-3.2	+25.0
Average percentage change ²	3.4	12.3

¹ Adjusted for seasonal variation.² Represents average of percentage changes without regard to signs.

Appendix A, tables 64 to 68, inclusive.

2. Seasonal variation in the demand for milk.—In most milk markets there is some seasonal variation in the demand for milk. Such seasonal variation is associated with factors such as changes in temperature, and the seasonal fluctuation in the size of the population, the latter of which is largely due to the vacation movement which in turn varies with the economic status of the population. For example, people tend to drink more milk during hot weather, apparently substituting milk to some extent in the summer for such hot drinks as coffee and tea. While this tendency serves to increase the volume of sales during the summer, the exodus of people from the city on their summer vacations tends to lessen the demand for milk in the city.

The seasonal variation in fluid-milk sales in certain selected cities is shown in table 19. The indices of seasonal variation in fluid-milk sales in Baltimore, Md., Boston, Mass., and the Twin Cities, Minn., were calculated by the median-link-relative method from data representing the fluid-milk sales by distributors purchasing milk from the producers' association in each market, the months in which price changes occurred being omitted. While there may be some question as to whether the sales figures from which the seasonal indices were computed are representative of the entire market, it is believed that they are fairly close approximations to the seasonal variation in sales in these markets because of the large proportion of the total milk in the market included in the figures.

TABLE 19.—*Indices of seasonal variation in fluid-milk sales by distributors purchasing from cooperative associations*

Month	Balti- more	Boston	Twin Cities	Fall River ¹	New York ²	Chicago ³	Fresno, Calif. ⁴	Alameda County, Calif. ⁵
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
January.....	97.7	96.9	93.8	94.5	93.6	98.2	91.0	97.7
February.....	98.6	97.6	101.0	93.3	94.9	100.2	98.7	102.5
March.....	100.2	98.6	101.4	97.6	97.5	101.3	97.5	103.3
April.....	100.4	97.2	101.8	101.8	100.2	100.1	99.6	101.7
May.....	103.1	99.5	99.5	109.7	103.3	99.8	101.9	99.7
June.....	101.4	102.8	98.1	110.8	108.9	102.1	99.9	97.4
July.....	99.0	106.8	98.0	100.8	107.6	98.4	98.1	93.8
August.....	96.4	103.1	99.1	102.1	102.3	96.3	97.7	98.3
September.....	100.5	100.5	100.1	100.4	101.8	101.2	105.5	101.8
October.....	103.0	100.4	102.5	98.4	99.8	103.2	104.8	105.5
November.....	101.0	100.7	101.7	94.4	96.0	101.1	104.1	102.2
December.....	98.7	95.9	98.0	96.2	94.1	98.1	101.2	98.1
Average.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹ Computed from reports of the market administrator. Average daily sales, 1935=100.

² Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, Technical Bulletin No. 73, U. S. Department of Agriculture, table 16.

³ Ross, H. A., The Marketing of Milk in the Chicago Dairy District, University of Illinois Agricultural Experiment Station Bulletin No. 239, table 18. Average monthly sales, 1920-22=100.

⁴ Tinley, J. M., An Analysis of the Fresno Milk Market, University of California Agricultural Experiment Station Bulletin No. 559, table 5.

⁵ Tinley, J. M., An Analysis of the East Bay Milk Market, University of California Agricultural Experiment Station Bulletin No. 534, table 7. Daily average, 1923-30=100.

Indices were calculated by the median-link-relative method from data of fluid-milk sales, omitting those months in which price changes occurred, for Baltimore, Boston, and Twin Cities. (See appendix A for basic data.)

The fluid-milk sales in Baltimore ranged from 96.4 percent of average daily sales in August to 103.1 percent in May; in Boston the range was from 95.9 percent to 106.8 percent of average daily sales in December and July, respectively. Sales in Fall River ranged from 93.3 percent to 110.8 percent of average daily sales in February and June, respectively, exhibiting a comparatively larger seasonal variation than the other cities previously discussed. In Alameda County, Calif., the range from the low to the high point was 11.7 percent of the average, in New York it was 15.3 percent of the average, and in Chicago it was 6.9 percent of the average. While these seasonal variations in sales may appear to be relatively small when considered in relation to something much more variable, such as milk production in most market milk supply areas, they are quite significant when it is remembered that, insofar as the influence of changes in prices and in the actual price level of milk was at least partly removed in several cases by the method of calculation, the variations represent a movement of the demand curve from average figures.⁶⁵ On the whole, it appears that there is considerable seasonal variation in the demand for milk. It is, of course, impossible to develop a series of indices of seasonal variation in the demand for milk which would be generally applicable to milk markets. Each market must be studied in relation to the conditions affecting it.

3. **Daily variation in the demand for milk.**—It is rather well recognized that there are significant variations in the amount of milk sold from day to day in a fluid-milk market, these variations being largely attributable to such factors as (1) consumption and working habits of the people which tend to show a regular day-of-the-week variation, (2) holidays, and (3) changes in temperature.

⁶⁵ See ch. 4, sec. II, for the difficulties encountered in giving precision to the concept of an increase or decrease in demand.

The consumption and working habits of the people cause a rather regular day-of-the-week variation in the sales of various products. Most business concerns, for example, do not operate on Sunday and many also close on Saturday afternoons. The Sunday dinner is frequently a heavier and more elaborate meal than that served on weekdays. These customs affect wholesale and retail sales of the various products differently. Wholesale sales of milk and cream are ordinarily low on Sunday, with sales to restaurants and cafeterias also low on Saturday. Sales of cream to stores are usually large on Saturday, Friday, and Monday. Route sales of milk and cream are usually heavier on Sunday.

Examples of the variation in the average sales on various days of the week for several markets are given in appendix A, tables 69-73. In general, the greatest variation is found in cream sales, the range for the New York market for all cream being from 84.7 percent of the average daily sales for the week on Sunday to 127.9 percent on Saturday. For all milk in the same market the range was from 90.2 percent of the average daily sales for the week on Sunday to 102.8 percent on Friday.⁶⁶ Examination of the tables indicates a greater variation in wholesale sales of fluid milk than in the retail sales, but for cream the reverse may be the case. These variations differ in the various sections of a large city, depending largely upon the economic status of the consumers and the number of persons who lunch away from home during the day.

II. VARIATIONS IN PRODUCTION

There are several types of variation in milk production which are perhaps most easily classified on the basis of time periods, such as day-to-day, week-to-week, year-to-year, and cycle-to-cycle.

Although there is, of course, some year-to-year variation in milk production, total milk production does not vary materially from year to year. Table 20 shows the index of total milk production on farms in the United States and by geographic divisions, with average 1929-34 production as the base period (1929-34=100). The maximum range in production during this period occurred in the West North Central States, production in 1934, a year of extreme drought, being 8.4 percent below production in 1933 when production in this area and in the country as a whole was the highest on record.

TABLE 20.—*Indices of milk production on farms in the United States, and by geographic divisions, 1929-34*

[1929-34 average=100]

Year	North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Million pounds</i>
Average 1929-34.....	16, 036	26, 932	27, 359	5, 710	13, 534	11, 028	100, 600
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1929.....	97.1	93.7	96.9	101.4	99.0	99.0	98.2
1930.....	99.0	99.5	99.5	97.1	96.9	101.4	91.4
1931.....	101.9	101.3	101.5	101.0	101.0	101.0	101.4
1932.....	101.0	100.5	101.3	101.1	104.2	99.8	101.3
1933.....	100.8	100.6	104.6	99.8	102.4	98.8	101.7
1934.....	100.2	99.4	96.2	99.6	96.6	100.0	98.3

Compiled from reports of the Bureau of Agricultural Economics.

⁶⁶ Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, Technical Bulletin No. 73, U. S. Department of Agriculture.

Year-to-year changes in production are due to such factors as differences in feed-production conditions that are associated generally with differences in weather and growing conditions, and shifts into and out of the dairy business due to changes in the relative profitableness of milk production as compared to other types of agricultural production. In fluid-milk markets there are other factors that may operate intermittently, such as the imposition of a sanitary regulation to the effect that all milk sold in the market as fluid milk and cream must come from cows free from tuberculosis, which regulation may operate to cause a marked decrease in the number of milk cows within the supply area, may markedly reduce production within the area for a short period of time, and may necessitate a temporary increase in the size of the milkshed.

Perhaps the most important type of variation in production, from the standpoint of its influence on prices, is seasonal. This variation is quite marked in most milksheds. Generally speaking, production is much lower in the fall and winter months than in the spring and summer months. Seasonal variation in total production is due largely to such factors as the greater supply of succulent feed available during the pasture season, the time of freshening of cows, inclement weather during the winter months, and the like. The seasonal variation in production is much greater in some market milk-supply areas than in others.

TABLE 21.—*Indices of seasonal variation in milk production in areas supplying milk to specified cities*

Month	Philadel- phia ¹	Baltimore ²	Chicago ³	Detroit ⁴	Los Angeles ⁵	Minneapo- lis and St. Paul, Minn. ⁶
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
January.....	92.8	94.5	100.4	88.6	100.5	99.9
February.....	92.2	95.1	106.3	92.5	100.7	105.6
March.....	93.2	95.3	111.4	95.1	99.8	107.6
April.....	102.3	103.8	113.1	97.0	99.8	114.4
May.....	109.5	109.2	124.9	112.7	100.5	119.0
June.....	111.6	110.3	123.2	118.8	100.0	117.2
July.....	107.0	105.4	94.1	112.4	99.4	104.7
August.....	101.3	100.5	86.1	108.3	97.9	91.8
September.....	100.6	99.4	81.4	104.5	98.7	83.4
October.....	97.9	96.4	85.2	96.1	99.4	80.2
November.....	97.1	95.7	83.6	86.8	101.0	84.4
December.....	94.6	94.9	90.3	87.2	102.3	91.8
Average.....	100.0	100.0	100.0	100.0	100.0	100.0

¹ Represents figures of receipts by 1 large dealer. Index numbers represent the ratio of each month to the average for the year, these ratios then being smoothed by a 3-months' moving average (average 1920-33).

² Shipments of all members of the Maryland State Dairymen's Association, Inc. Trend was removed by 12-months' moving average, and indices represent ratios to this average smoothed with a 3-months' moving average (average 1919-33).

³ Compiled from Ross, H. A., *The Marketing of Milk in the Chicago Dairy District*, University of Illinois Agricultural Experiment Station Bulletin No. 269 (average 1920-22=100).

⁴ Compiled from Horner, J. T., *The Detroit Milk Market*, Special Bulletin No. 170, Michigan State College (average 1924-26=100).

⁵ Compiled from Spencer, Leland, *An Economic Survey of the Los Angeles Milk Market*, University of California Agricultural Experiment Station Bulletin. Figures represent index numbers of deliveries of 50 regular shippers, corrected for trend (average 1925-30=100).

⁶ Computed from figures compiled from Twin City Milk Producers' Association, History Series No. 7, *The National Milk Producers' Federation*. Trend was removed by means of a 12-months' moving average (average 1918-31=100).

Table 21 shows the seasonal variation in total milk production in the areas supplying milk to six selected cities. Los Angeles, Calif., shows the lowest range in production during the year, 4.4 percent of

the average, with Chicago showing a range of 43.5 percent of the average. However, the data for Chicago cover the period 1920-22 and therefore may not be representative of the seasonal variation in production in the Chicago supply area at the present time. The data for the Minneapolis and St. Paul, Minn., supply area show a range of 38.8 percent of the average.

There are often important differences in the seasonal variation in milk production in different portions of the supply area, particularly the supply area of large markets. Table 22 shows the seasonal variations in total receipts of milk and cream at Boston from the States of Maine, New Hampshire, Vermont, and Massachusetts. Massachusetts shows the lowest range, 19.8 percent, and Maine the highest, 51.8 percent, of the average for the year. Total receipts from the four States ranged from 86.0 percent of average in December to 127.6 percent of average in June.⁶⁷

TABLE 22.—*Seasonal variation¹ in total receipts of milk and cream at Boston from the States of Maine, New Hampshire, Vermont, and Massachusetts*

Month	Maine	New Hampshire	Vermont	Massachusetts	Total, 4 States
	Percent	Percent	Percent	Percent	Percent
January.....	101.9	96.8	89.0	109.5	93.1
February.....	95.2	90.8	88.6	102.7	89.9
March.....	100.8	87.8	98.7	103.4	98.3
April.....	102.9	93.3	107.2	103.5	105.0
May.....	109.1	99.3	118.6	106.3	114.5
June.....	131.9	122.9	129.7	102.7	127.6
July.....	93.7	105.8	106.6	89.7	103.7
August.....	80.1	95.6	95.3	93.8	93.1
September.....	100.3	105.1	97.7	95.6	98.8
October.....	98.1	109.9	101.6	97.7	101.7
November.....	93.6	99.5	84.6	96.7	88.3
December.....	92.4	93.2	82.4	98.4	86.0
Average.....	100.0	100.0	100.0	100.0	100.0

¹ Figures converted to daily average sales per month, seasonal variation computed for each year, then combined to secure seasonal for the period 1932-34.

Computed from reports issued by the Bureau of Agricultural Economics.

Table 23 shows the seasonal variation in production per day per dairy, of producers delivering to plants in various counties of New York, Pennsylvania, and New Jersey, shipping to the New York milk market. These figures indicate large differences in seasonal variation in production in different portions of the supply area for the New York milk market.

There are also marked variations in the seasonality of production of different producers. These are largely associated with the numerous differences found in the type of farm organization and operation being followed on different farms. Some producers are specialized dairy producers, in the sense that milk production is their major enterprise. Others follow a general type of farming, and still others have some major enterprise, such as grain production, with dairying relegated to a position of minor importance. In addition, farming practices other than enterprise combinations just noted have an influence on the seasonality of milk production. Some producers rely mainly on grass feeding, supplemented by perhaps a small amount of grain feeding.

⁶⁷ Figures given in table 22 are receipts of milk and cream at Boston from specified States and therefore, although probably a close approximation to it, do not actually represent seasonal variation in production in the areas specified.

Others feed relatively more grain. Some producers breed their cows in the fall, others in the spring. Again, mere size influences the seasonality of milk production, other factors being the same, since it is generally recognized that large producers usually maintain a more even flow of milk than do small producers.

TABLE 23.—*Indices¹ of seasonal variation in production per day per dairy of producers delivering to plants in various counties in New York, Pennsylvania, and New Jersey, shipping to the New York milk market*

Month	New York				Pennsylvania			New Jersey
	Chenango	Jefferson	Orange	St. Lawrence	Erie	Northumberland	Union	Hunterdon
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
January.....	89.2	77.2	109.7	50.6	77.2	102.6	95.8	101.3
February.....	88.3	73.5	107.6	59.8	81.9	104.0	98.1	103.2
March.....	95.9	78.2	107.0	89.7	97.1	105.4	98.1	103.7
April.....	107.6	95.7	102.0	113.4	117.7	102.3	97.2	102.9
May.....	129.7	132.0	109.2	144.5	149.0	111.8	109.0	113.7
June.....	136.8	154.9	103.7	172.1	155.6	110.3	115.2	112.7
July.....	106.9	127.7	81.6	148.9	124.1	91.9	104.1	93.3
August.....	87.8	107.6	79.0	122.9	98.2	94.3	102.8	92.8
September.....	88.6	101.9	89.6	106.5	82.7	94.7	101.8	94.0
October.....	96.5	93.1	103.1	86.6	77.0	96.0	97.8	93.6
November.....	86.6	79.3	100.4	56.1	67.4	91.0	89.5	93.7
December.....	86.1	78.9	107.1	48.9	72.1	95.7	90.6	95.1
Average.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹ Seasonal variation calculated on the basis of average daily production by months, 1930-34. Index numbers represent the ratio of each month to the average for the year, these ratios then being smoothed by a 3-months' moving average.

Computed from records of the Dairymen's League Cooperative Association, Inc.

Lininger, in a study of the rating plan in Philadelphia, found rather significant differences among the seasonal variations of production of producers in different areas, such differences apparently being associated in part with differences in types of farming. In this study farms were classified by types, as follows:⁶⁸

- (a) General farms with pasture.
- (b) Dairy farms.
- (c) General farms with little pasture.
- (d) Crop farms.

Table 24 and figure 14 show the ranges in production from the low point to the high point, expressed as a percentage of average, October 1 to September 30, inclusive, for the types of farms just noted, as follows:

- (a) General farms with pastures: 1921-22, 16.6 percent; 1924-25, 28.6 percent.
- (b) Dairy farms: 1921-22, 19.8 percent; 1924-25, 31.6 percent.
- (c) General farms with little pasture: 1921-22, 33.8 percent; 1924-25, 24.3 percent.
- (d) Crop farms: 1921-22, 42.3 percent; 1924-25, 30.3 percent.

On the whole, it appears that not only are there marked differences in the seasonal variation of production in different portions of the area supplying milk to large milk markets but also there are probably significant differences in the seasonal variation of production among producers in the same area.

⁶⁸ Farms were classified into types on the basis of the proportion of total income represented by income from dairying and the amount of pasture on the farms, as follows: General farms with pasture, farms with 40 to 74 percent of the income from milk and over 5 percent of the farm acreage in permanent pasture. Dairy farms, farms with over 75 percent of the income from milk. General farms with little pasture, farms with 40 to 74 percent of the income from milk and under 5 percent of the farm acreage in permanent pasture. Crop farms, farms with less than 40 percent of the income from milk and over 18 percent of the crop acreage in wheat. Lininger, F. F., The Relation of the Basic-Surplus Marketing Plan to Milk Production in the Philadelphia Milk Shed, Pennsylvania State College, Agricultural Experiment Station, Bulletin No. 231.

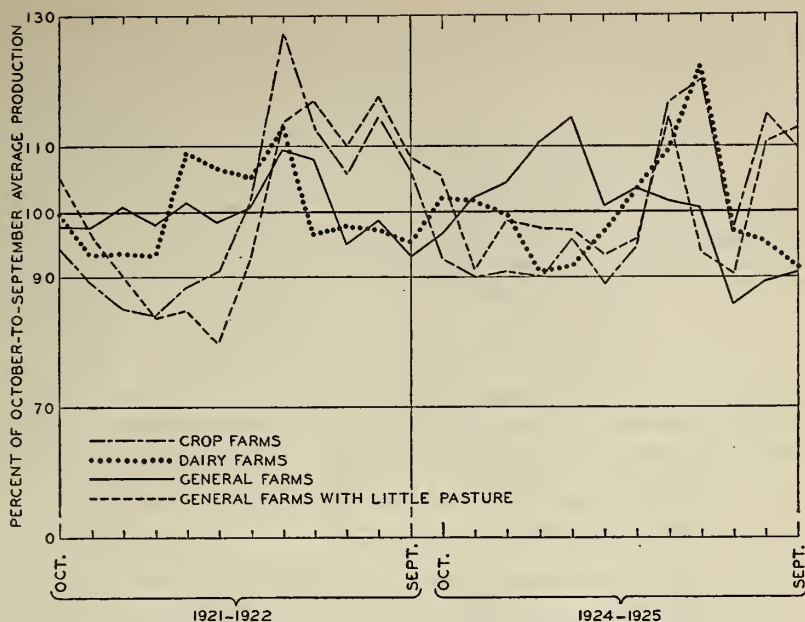


FIGURE 14.—Seasonal variation in milk production by types of farms, in the area supplying milk to Philadelphia, Pa., October 1921–September 1922–October 1924–September 1925.

TABLE 24.—Seasonal variation in milk production per farm for 4 types of farming, in the area supplying milk to Philadelphia, Pa., 1921–22 and 1924–25

Year and month	Seasonal variation in milk production on—			
	General farms with pasture	Dairy farms	General farms with little pasture	Crop farms
	Percent	Percent	Percent	Percent
<i>1921</i>				
October.....	97.7	99.6	105.2	94.2
November.....	97.6	93.1	96.9	89.1
December.....	100.8	93.4	90.3	85.1
<i>1922</i>				
January.....	98.0	93.2	83.7	83.9
February.....	101.6	109.0	84.9	88.5
March.....	98.6	106.6	79.9	90.9
April.....	100.7	105.4	92.7	101.5
May.....	109.7	112.9	113.5	127.4
June.....	108.1	96.5	117.0	112.8
July.....	95.2	97.8	110.0	105.9
August.....	98.9	97.3	117.5	114.4
September.....	93.1	95.2	108.4	106.3
Average.....	100.0	100.0	100.0	100.0
<i>1924</i>				
October.....	96.7	101.9	105.4	92.8
November.....	102.1	101.6	91.0	90.0
December.....	104.4	99.6	98.6	90.5
<i>1925</i>				
January.....	110.4	90.5	97.6	89.8
February.....	114.3	91.6	97.2	95.5
March.....	100.9	96.9	93.2	89.0
April.....	103.9	103.4	95.8	94.4
May.....	101.7	109.3	114.5	116.7
June.....	100.5	122.1	93.8	120.1
July.....	85.7	96.4	90.2	96.8
August.....	89.1	95.3	110.3	114.8
September.....	90.3	91.4	112.4	109.6
Average.....	100.0	100.0	100.0	100.0

Computed from figures contained in Lininger, F. F., The Relation of the Basic-Surplus Marketing Plan to Milk Production in the Philadelphia Milk Shed, Pennsylvania State College Experiment Station, Bulletin No. 231, table 10.

An example of the differences in the seasonal variation of production of individual producers is indicated by an analysis of figures secured by the Dairy Section of the Agricultural Adjustment Administration pertaining to shipments by producers supplying milk to the Baltimore, Md., market. The measure of seasonal variation used is the percentage that production during the month of low deliveries is of production during the months of high deliveries. This measure, though admittedly open to some objection, nevertheless serves fairly well as an indication of the seasonal variation in production of individual producers. These figures are shown in the form of a cross classification in table 25, the other variable being size, as measured by the total volume of milk delivered during the year. Over half of the producers in the sample fall within the group wherein deliveries during the month of low deliveries range from 50 percent to 79 percent of deliveries during the month of high deliveries. The range in evenness in production of the producers in the sample varied markedly. Three of the producers fell within the group wherein the percentage deliveries during the month of low deliveries were only 10 to 19 percent of deliveries during the month of high deliveries, and two fell within the 80 to 89 percent range.⁶⁹

TABLE 25.—*Frequency distribution of percentage that production during the month of low deliveries is of production during the month of high deliveries, for 104 producers supplying milk to the Baltimore market in 1934, classified according to volume delivered*

Size group—production (1,000 pounds)	Percentage that deliveries in low month are of deliveries in high month										Number of pro- ducers
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	
0-9											1
10-19					1						1
20-29			2	1	2	5	1				11
30-39		1		4	2	1	2				11
40-49				4	5	3	4	1			17
50-59		1		1	1	3	2	1			9
60-69					2	8	3	1			15
70-79				1			4				7
80-89				1	1	3	3				8
90-99				1		1	1	2			5
100-109						2	1	1	1		6
110-119				1		1	1	1	1		4
120-129						1					1
130-139						1		2			3
140-149											
150-159											
160-169							1				1
170-179											
180-189								1			1
190-199					1						1
200-209											
210-219											
220-229							1				1
230-239							2				2
Number of producers....		3	2	14	17	29	26	11	2		104

Compiled from unpublished data in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

⁶⁹ The percentages relate to production by individual producers.

The figures show that there tends to be a positive relationship between evenness of production, and the total volume produced during the year, the larger producers tending to show less seasonal variation in production. This is true in spite of the fact that only one factor, size, has been related to evenness in production and, as was pointed out before, many factors are associated with seasonal variation in production. That other factors also influence seasonal variation in production is indicated by the fact that producers falling within the same frequency, as regards the percentage that production during the month of low deliveries is of production during the month of high deliveries, vary extremely in size as measured by total annual deliveries.

III. THE SEASONAL EXCESS

As was pointed out in the preceding sections of this chapter, there is some seasonal variation in the sales of milk to consumers. Also, there are significant variations in production from season to season in many milk markets. Thus sales of milk to consumers remain relatively constant throughout the year and production varies markedly in many cases, with the result that during the season of flush production the volume of milk produced within the supply area is materially in excess of the volume sold to consumers in the form of fluid milk. This excess in supply over the volume sold by distributors as milk is termed the seasonal excess in this treatise. Examples of the seasonal excess are set forth below, most of the data and information used being taken from published studies.

In table 26 are shown figures relating to the volume of milk produced by members of the Maryland State Dairymen's Association, Baltimore, Md., fluid-milk sales of distributors purchasing milk from the association, and the percentage such fluid-milk sales are of the total volume produced by association members, during the period January 1929 to December 1931, inclusive. Total production and total fluid-milk sales were markedly constant during this period. Total production amounted to 27,000,000 gallons, 27,000,000 gallons, 28,000,000 gallons, and 27,300,000 gallons, while fluid-milk sales totaled 18,800,000 gallons, 18,900,000 gallons, 18,500,000 gallons, and 17,600,000 gallons in 1928, 1929, 1930, and 1931, respectively. However, the situation with respect to seasonal production and sales was quite different. Fluid-milk sales were markedly constant, while production varied markedly. Fluid-milk sales usually were a smaller proportion of milk production during May and a higher proportion during the winter months. The sales and production data given in table 26 are graphically depicted in figure 15. It is obvious that fluid-milk sales were relatively constant, while the seasonal increases and decreases in production were reflected in increases and decreases in the volume of milk sold in excess of fluid-milk sales.

Similar results are secured when data with respect to the Twin Cities, Minn., Los Angeles, Calif., Boston Mass., and Chicago, Ill., markets are analyzed. These data are set forth in the order above named in appendix A, tables 74-77.

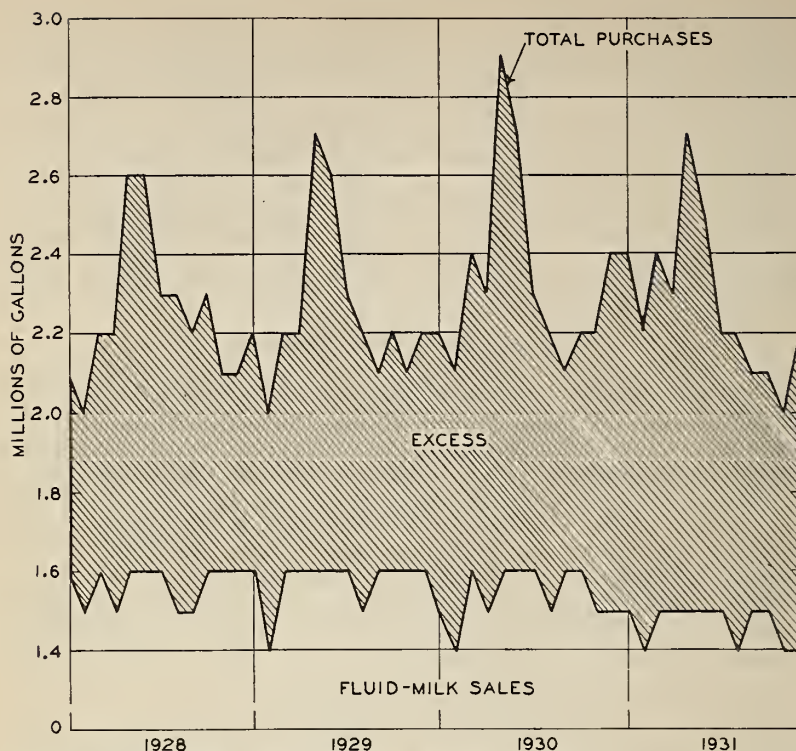


FIGURE 15.—Purchases and fluid-milk sales of distributors purchasing from members of the Maryland State Dairymen's Association, Baltimore, Md., 1928-32.

TABLE 26.—Production and fluid-milk sales to distributors, Maryland State Dairymen's Association, 1928 to 1931, inclusive, by months

Month	1928			1929		
	Production	Fluid sales	Percent fluid sales are of production	Production	Fluid sales	Percent fluid sales are of production
	Million gallons	Million gallons	Percent	Million gallons	Million gallons	Percent
January.....	2.1	1.6	76.2	2.2	1.6	72.7
February.....	2.0	1.5	75.0	2.0	1.4	70.0
March.....	2.2	1.6	72.7	2.2	1.6	72.7
April.....	2.2	1.5	68.2	2.2	1.6	72.7
May.....	2.6	1.6	61.5	2.7	1.6	59.3
June.....	2.6	1.6	61.5	2.6	1.6	61.5
July.....	2.3	1.6	69.6	2.3	1.6	69.6
August.....	2.3	1.5	65.2	2.2	1.5	68.2
September.....	2.2	1.5	68.2	2.1	1.6	76.2
October.....	2.3	1.6	69.6	2.2	1.6	72.7
November.....	2.1	1.6	76.2	2.1	1.6	76.2
December.....	2.1	1.6	76.2	2.2	1.6	72.7
Total or average.....	27.0	18.8	69.6	27.0	18.9	70.0

TABLE 26.—*Production and fluid-milk sales to distributors, Maryland State Dairymen's Association, 1928 to 1931, inclusive, by months—Continued*

Month	1930			1931		
	Production	Fluid sales	Percent fluid sales are of production	Production	Fluid sales	Percent fluid sales are of production
	Million gallons	Million gallons	Percent	Million gallons	Million gallons	Percent
January.....	2.2	1.5	68.2	2.4	1.5	62.5
February.....	2.1	1.4	66.7	2.2	1.4	63.6
March.....	2.4	1.6	66.7	2.4	1.5	62.5
April.....	2.3	1.5	65.2	2.3	1.5	65.2
May.....	2.9	1.6	55.2	2.7	1.5	55.6
June.....	2.7	1.6	59.3	2.5	1.5	60.0
July.....	2.3	1.6	69.6	2.2	1.5	68.2
August.....	2.2	1.5	68.2	2.2	1.4	63.6
September.....	2.1	1.6	76.2	2.1	1.5	71.4
October.....	2.2	1.6	72.7	2.1	1.5	71.4
November.....	2.2	1.5	68.2	2.0	1.4	70.0
December.....	2.4	1.5	62.5	2.2	1.4	63.6
Total or average.....	28.0	18.5	66.1	27.3	17.6	64.5

Compiled from History of Maryland State Dairymen's Association, History Series No. 2, The National Cooperative Milk Producers' Federation, appendix, table 6.

IV. THE DAILY EXCESS

The facts and considerations set forth in the preceding sections of this chapter show that there is considerable daily variation in the demand for milk. Distributors have found it necessary to have available a supply of milk sufficient at all times to meet the daily variation in the demand for milk. This supply, in excess of average daily sales, may be termed the operating reserve. It varies according to the nature of the distributors' business, but it appears that a volume of about 10 percent in excess of the average daily sales of distributors is probably necessary in order to meet daily variations in the demand for milk.

V. SUMMARY

The data and information presented in this chapter may be summarized as follows:

(1) The sales of milk to consumers following changes in prices vary inversely to price changes, other factors being the same, and the change in milk sales appears to be less than proportional to the change in prices. It appears, therefore, that the demand for milk is relatively inelastic.

(2) There is considerable daily variation in the demand for milk, on account of changes in the weather, holidays, etc.

(3) There is some seasonal variation in the demand for milk, because of such factors as seasonal changes in weather conditions, the vacation movement, and other factors.

(4) Seasonal variation in production is quite marked in many milksheds.

(5) There are wide differences in the seasonal variation of production in different sections of the areas supplying milk to many large milk markets, because of differences in the type of farming and other factors.

(6) There are wide differences in the seasonal variation of production of individual producers, largely because of such factors as differences in type of farming and feeding practices.

(7) The relatively small seasonal variation in fluid-milk sales as compared with the seasonal variation in milk production in many milk supply areas results in a seasonal excess of milk production over fluid-milk sales. The size of this excess depends upon the seasonal variation in fluid-milk sales relative to production and is generally larger in those areas wherein the seasonal variation in production is large.

(8) There are rather marked daily variations in the demand for milk. As a result, distributors find it necessary to have on hand a volume of milk somewhat in excess of average daily sales. This daily excess or operating reserve probably amounts to about 10 percent of average daily sales, depending upon the nature of the distributors' business and upon other factors.

CHAPTER 4

THE GENERAL THEORY OF MILK PRICES

The preceding chapters have developed certain facts and information concerning the dairy industry in the country as a whole, concerning the size of business units and as regards cooperative associations, concerning their price-making activities, the development and some indication of the extent of classified-price plans and various pooling devices, and some details regarding supply and demand in fluid-milk markets. In this chapter the general theory of milk prices will be developed in an effort to ascertain the general economic principles underlying the structure of milk markets at the present time. Use will be made of certain concepts and terms that are the tools of the economist, and only so much discussion of such concepts will be presented as appears necessary in the interest of clarity of presentation.

In developing the theory it is desirable to start with a very simple market structure. In this connection it may appear that the theory wanders far afield from the actual situation found in milk markets at the present time. However, there may be markets, particularly small markets where the supply is not organized and distributors are numerous and small, to which such theory definitely applies. In any case it is probably much easier to understand the complicated market structures found in many milk markets if the nature of the structure prior to its evolution to a complicated form is understood. This type of approach to the development of a general theory of milk prices has been used because it is thought that it will lead to a more thorough understanding of the complicated price structure obtaining in many milk markets, and because it furnishes one basis of comparison and appraisal of the price structure.

I. THE GENERAL THEORY OF MILK PRICES IN SIMPLE MARKETS

In this section is presented the general theory of milk prices for milk markets in which the output of individual producers and individual distributors is such a small portion of the volume produced and sold in the market that it has no practical effect upon the market price, and in which there is no product differentiation.

In such markets, which for convenience may be termed simple markets, the producer or distributor will sell as much or as little as will return to him the largest profit (or the least loss) in view of the ruling market price. The volume he will produce or sell will be a function of his costs, on the one hand, and of the ruling market price on the other. Thus assume the market price to be pk in figure 16, ac the average cost per unit of a marginal producer (a producer who would tend to go out of production if the price were lower) or the cost curve including rents of a submarginal producer, and mc the marginal cost curve (the cost per each additional unit produced). The average

cost curve includes the profit necessary in order that the requisite volume of producer or distributor services be forthcoming. The producer or distributor (for convenience hereinafter in this section called the seller) will, under the conditions of cost and price set forth in figure 16, produce the volume ov , that being the point where actual loss is not involved, that is, each additional unit of volume produced after this point is reached would cost more than it would bring. So much for the operations of the individual producer or distributor in simple markets, i. e., operating under conditions of simple competition.⁷⁰

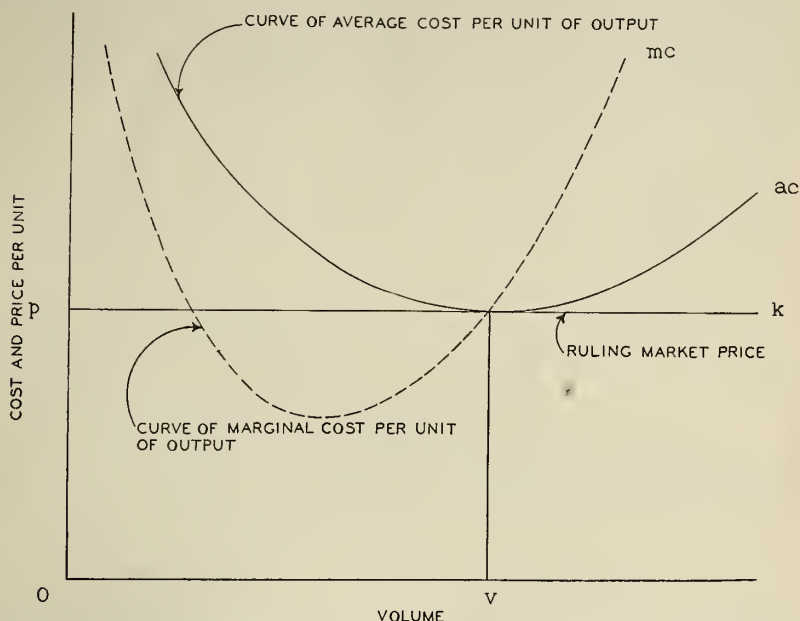


FIGURE 16.—Cost curves and output of an individual producer operating under conditions of simple competition.

In figure 17 is presented an illustration of the pricing process in a simple market. Assume the demand curve dd and the supply price curve ss . The point a , at which these lines intersect, represents the price at which the economic forces are in equilibrium. It is a price which also equates demand and supply, i. e., no larger quantity will be offered except at higher prices, and no larger volume will be taken except at lower prices. (See fig. 17.)

The discussion now proceeds to a consideration of the price structure for milk, starting with simple markets and progressing to more and more complex markets. Nowhere in this section is any attention given to the factors affecting distributors' margins, or the supply price of distributors' services, which are assumed to be determined under conditions of simple competition. The problem is, what will be the f. o. b. city price of milk and what will be the farm-price structure, assuming that in all cases distributors' margins are determined under conditions of simple competition?

⁷⁰ The terms "simple markets" and "simple competition" are used interchangeably in this chapter.

1. The milk-price structure: Uniform quality—centralized processing—no variation in demand or supply.—The price structure for milk is first examined under the following simplifying assumptions:

- (1) Local delivery costs and labor are the same for all classes of product.
- (2) There is no variation in the demand for milk in different forms.
- (3) All milk, whether sold to consumers as fluid milk or as other dairy products, is of uniform quality.
- (4) All milk is brought to the city in fluid form, there to be processed into the various dairy products.
- (5) There is no variation in the volume of milk sold per farm from day to day.

Under the conditions noted above it is obvious that producers would receive the same per-unit price for all milk, since each unit of the supply is interchangeable with every other unit. This would be true regardless of whether the milk were sold to the consumer as fluid milk, as fluid cream, or as manufactured dairy products.

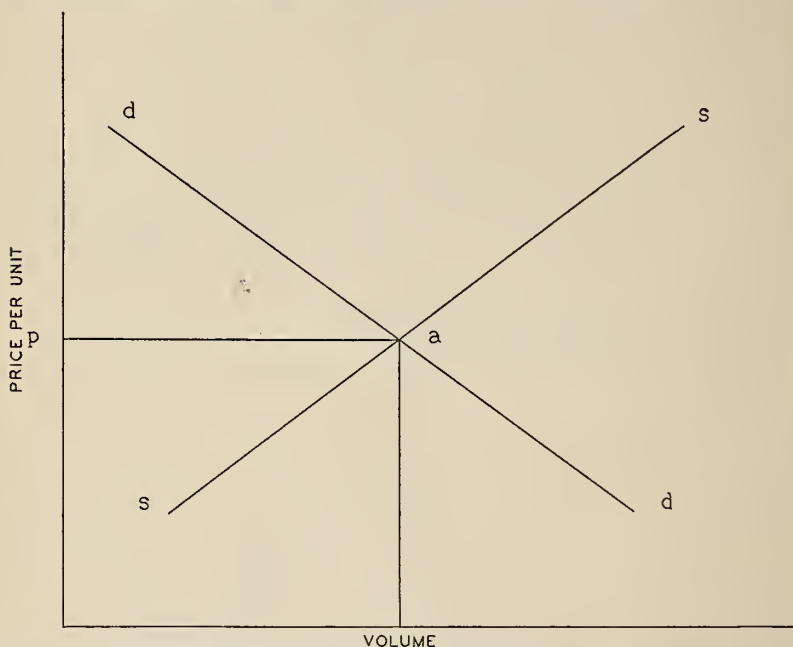


FIGURE 17.—Equilibrium price under conditions of stable equilibrium in simple markets.

However, it is well recognized that the butter and other manufactured dairy product equivalents of a unit of fluid milk can be transported long distances at very low cost per product equivalent of a unit of milk as compared to the cost of transporting a unit of fluid milk the same distance, and can be kept in storage for a relatively long period of time without appreciable deterioration in quality. Manufactured dairy products are composed largely of milk solids, i. e., one or more of the constituents of milk, concentrated to a very much greater degree than in whole milk. Thus in many cases it is more economical to produce the finished product, such as butter or cheese, at a distance from the market and transport it to the market rather than to transport the whole milk to the market and there process it into the finished product (unless, of course, the demand for

all the products of milk in the market can be satisfied from the volume of milk produced in the area immediately surrounding the market). For example, 100 pounds of butter contains approximately 80 pounds of butterfat, and 100 pounds of 3.5 percent milk contains 3.5 pounds of butterfat. Assuming that transportation costs per 100 pounds of product are equal, the cost of transporting butterfat in the form of butter and in the form of 35 percent cream would be about one twenty-third and one-tenth, respectively, of the cost of transporting butterfat in the form of milk. These facts explain in part why manufactured dairy products in many cases are produced, hundreds of miles from the market, and shipped to the market in finished product form rather than shipped to the market in the form of fluid milk and there processed into the finished product.

2. The milk-price structure: Uniform quality—decentralized processing.—In considering the manner in which the transportation factor affects the price structure for milk within a milkshed, the preceding assumption that all milk is brought to market, there to be processed into the several milk products, is now dropped and, instead, in addition to the remaining assumptions noted previously, it is assumed that:

(1) All the milk which is produced within 200 miles from the market is required for fluid milk.

(2) All the milk which is produced in the area between 200 and 250 miles from the market is required for fluid cream.

(3) All the milk which is produced within the area between 250 and 500 miles from the market is required for butter.

(4) Transportation costs vary in direct proportion to distances at the following rates per unit per mile:

(a) Whole milk, 0.2 cent per hundredweight.⁷¹

(b) The cream equivalent of 100 pounds of 3.5 percent milk, 0.02 cent.

(c) The butter equivalent of 100 pounds of 3.5 percent milk, 0.005 cent.

(5) The farm value of skim milk equals the cost of separating cream from milk.

(6) The f. o. b. city price of the butter equivalent of a hundredweight of 3.5 percent milk (for ease in presentation it is assumed that the overrun is necessary to cover the manufacturer's margin) is \$1.

Under the assumptions above the f. o. b. city prices that must be paid for milk in order to secure the volume necessary to meet the demand for milk, as well as the f. o. b. city prices that must be paid for the cream equivalent of 100 pounds of milk to meet the demand for cream, can be readily computed. Thus with the f. o. b. market price of the butter equivalent of 100 pounds of 3.5 percent milk at \$1, the farm price of 100 pounds of milk which is converted to butter at a point 500 miles from the market is \$1, less the cost of transporting the butter equivalent of 100 pounds of such milk to the market, or \$0.975 ($\$1 - 500 \times 0.005$ cent). At a point 250 miles from market the farm price of milk used for butter is \$0.9875 ($\$1 - \0.0125 transportation costs = \$0.9875). The farm price of milk used to produce cream at a point 250 miles from the city must be equal to the farm price of milk used to produce butter at that point, else farmers will sell their milk for use in butter rather than as cream, and the f. o. b. city price of the cream equivalent of 3.5 percent milk will be the farm price of such milk at a point 250 miles from the market plus the cost of transporting the cream equivalent of 100 pounds of 3.5 percent milk from that point to the city, or \$1.0375 ($\0.9875 farm price at 250-mile point plus \$0.05 transportation costs to market = \$1.0375). Similarly, the f. o. b. city price of 3.5 percent milk will be the farm price of milk used for cream at a point 200 miles from the market plus the cost of trans-

⁷¹ Approximate rate for shipment in carlots from the 200-mile zone to Boston.

porting fluid milk to the market, or \$1.3975 (\$0.9975 farm price at 200-mile point plus transportation costs of \$0.40=\$1.3975).

Therefore, under the conditions assumed, the prices for milk and milk products f. o. b. city would be as follows:

- (1) Fluid milk, \$1.3975 per hundredweight.
- (2) The cream equivalent of 100 pounds of 3.5 percent milk, \$1.0375.
- (3) The butter equivalent of 100 pounds of 3.5 percent milk, \$1 (assumed, but, of course a different price f. o. b. the market for the butter equivalent of 100 pounds of 3.5 percent milk would be associated with different prices than those computed above for the other milk products).

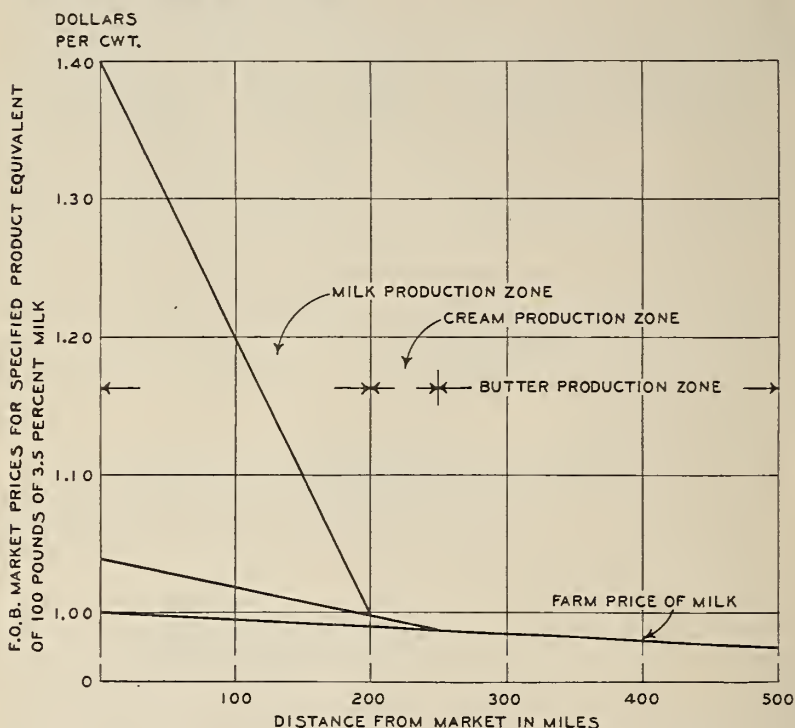


FIGURE 18.—Production zones and farm-price structure for specified dairy products as influenced by the transportation-rate structure.

Under the conditions assumed it is also obvious that milk would not be shipped to the city to be processed into the several dairy products (except in case of error or lack of knowledge with respect to the most profitable channel of disposal). Prices in the city would be quoted for milk, cream, and butter. All milk brought to the city would command one price, cream another, etc. Thus there would be no differentiation in milk prices f. o. b. the city.

The farm price for milk at any given point within any particular zone under the conditions assumed is, of course, equal to the farm price of milk at the outer edge of the zone plus the difference between the cost of shipping milk in the particular form to the market from the outer limit of the zone and the cost of shipping such milk from any given point within the zone. The farm-price structure for milk that would obtain under the conditions set forth above is shown in figure 18.

3. The milk-price structure: Varying quality requirements—decentralized processing.—If the assumption that all milk is of uniform quality is discarded and it is assumed that the quality requirements for milk used in the form of fluid milk and cream are higher than those for milk used in the production of butter, then the type of market under analysis is somewhat more comparable to the rather complex type of milk market now obtaining in many large urban areas.

Sanitation requirements differ somewhat among milk markets. Usually the requirements cover such items of sanitation as periodic veterinary examination of cows, cleanliness of cows, cleanliness of dairy barns in addition to specifications with respect to the type of flooring and lights, specifications with respect to the type and care of the milk house, to the cleaning and care of utensils, and rules and regulations pertaining to the milking and handling of the milk. Also, quality requirements pertain to such things as chemical content and specification of the maximum bacterial count allowable, etc. Tables 27 and 28 show the minimum chemical requirements and the maximum bacteria counts allowed in cities, by size groups.

TABLE 27.—Average minimum chemical requirements of cities grouped according to population

Population group	Number of cities ¹	Percent butterfat	Percent solids-not-fat	Percent total solids
500,001 and over.....	11	3. 2045	8. 500	11. 906
100,001 to 500,000.....	37	3. 235	8. 544	11. 896
75,001 to 100,000.....	12	3. 2660	8. 500	11. 887
50,001 to 75,000.....	27	3. 188	8. 493	11. 883
25,001 to 50,000.....	67	3. 182	8. 525	11. 965
10,001 to 25,000.....	120	3. 219	8. 490	11. 870
10,000 and less.....	82	3. 220	8. 447	11. 887
Total.....	356			

¹ Applies only to butterfat requirements. Several cities do not have solids-not-fat or total solids requirements.

Compiled from Milk Inspector Letter No. 123, Bureau of Dairy Industry, January 1928.

TABLE 28.—Maximum bacterial counts allowed for standard pasteurized milk for cities in the various population groups

Population groups	Before pasteurization						After pasteurization									
	100,000 and less	100,001 to 500,000	500,001 to 1,000,000	1,000,001 and over	Dual standards ¹	No requirements	Number of cities in group	10,000 and less	10,001 to 30,000	30,001 to 50,000	50,001 to 75,000	75,001 to 100,000	100,001 and over	Dual standards ¹	No requirements	Number of cities in group
500,001 and over.....		1	4		1	3	11			4		6		1		11
100,001 to 500,000.....	1	9	7	2		17	43	2	2	10	4	11	4	1	9	43
75,001 to 100,000.....		2	2			10	14		1	3		3		1	6	14
50,001 to 75,000.....		4	8	2		15	30		1	9	1	8	2	1	8	30
25,001 to 50,000.....	5	9	13		4	43	74	2	2	13	2	18	2	5	30	74
10,001 to 25,000.....	2	23	20	5	2	72	124		9	20	2	30	7	6	50	124
10,000 and less.....		7	12	2	2	85	108	1	1	21	1	15	6	2	61	108
Total.....	8	55	66	20	10	245	404	5	16	80	10	91	21	17	164	404

¹ Dual standards, winter and summer requirements differ.

Compiled from Milk Inspector Letter No. 126, Bureau of Dairy Industry, April 1928.

In most cases the sanitation requirements under which milk is produced for fluid milk and cream are more stringent than those under which milk is produced for manufacturing purposes. It should be obvious that these requirements operate to increase the cost of producing milk for use as fluid milk and cream, as compared to the cost of producing milk for manufacturing purposes. Thus, over a period of time the supply price ⁷² of a given volume of milk used for fluid milk and cream will be somewhat higher than the supply price of the same volume of milk used for manufacturing purposes, other factors remaining constant. Of course, the difference between the supply prices of milk produced for use in different products in any milk area, other factors being the same, will depend upon the differences in the sanitation requirements applicable to milk produced for use in the different products. If it were assumed that sanitation requirements raise the supply price of milk for use as fluid milk and cream 20 cents per hundredweight per farm above the supply price per hundredweight for milk used for manufacturing purposes, the price structure under the assumed conditions would be similar to that set forth in figure 19.

Under the conditions assumed, the prices for milk and milk products f. o. b. city would be as follows:

- (1) Fluid milk, \$1.5975 per hundredweight.
- (2) The cream equivalent of 100 pounds of 3.5 percent milk, \$1.2375.
- (3) The butter equivalent of 100 pounds of 3.5 percent milk, \$1.

In figure 19 the line *pp* represents the farm price of milk used for fluid milk and cream; the line *am* the farm price for milk used in the production of butter. It should be noted that as yet no factor has been introduced that will operate to establish different prices for milk, as such, f. o. b. the city. Under the assumed conditions all milk produced within a particular zone would be used in the production of the same product. No milk would be shipped to the market as milk from the cream zone, etc. Stated differently, there would be no differentiation between the price of milk based on the form in which such milk was sold f. o. b. city. Also, no factor has been introduced that will operate so that individual producers will receive different prices for different portions of their milk. Producers within each zone would sell all of their milk at one price. Farm prices in a particular zone would vary as transportation costs from different points in the zone to the city varied, and would vary between zones because of differences in transportation costs of milk and the product equivalent of milk, and because of differences in cost of producing milk engendered by differences in the sanitation regulations applicable to milk and milk products.

4. The milk-price structure: Decentralized processing—uniform quality—variations in production.—The data and information set forth in chapter 3 indicate that there is considerable variation in the production of milk within the supply areas of many large markets. In this section the assumption that there are no variations in production is dropped and the influence of variations in production upon the price structure for milk in a simple market will be considered. The influence of seasonal variation in production is first considered.

For purposes of presentation it is assumed that (1) the sanitation regulations are the same for all milk regardless of the form in which

⁷² The price that must be paid in order that a given volume of milk of the desired quality will be forthcoming.

it is sold; (2) production varies seasonally; (3) there is no difference between the seasonal production curves of individual producers; (4) the several demand schedules are fixed; (5) none of the products can be stored; (6) the elasticity of demand for the several products is unitary; and (7) the market is isolated, so that the effect of variations in production upon prices in one supply area cannot be reduced by the

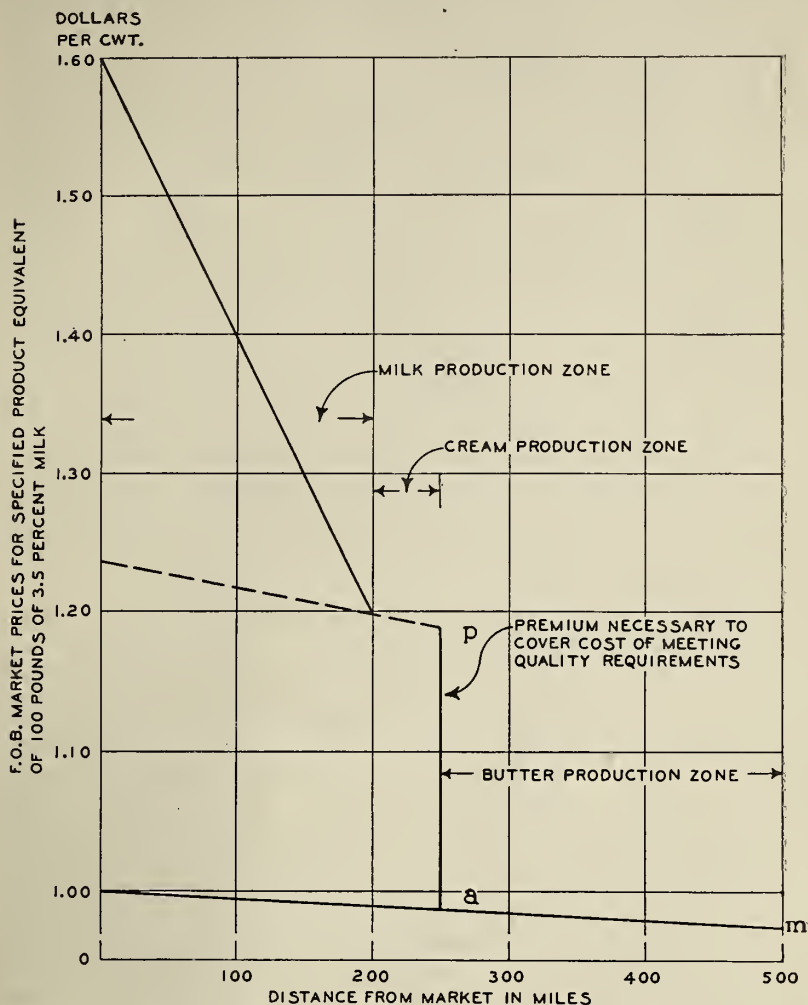


FIGURE 19.—Production zones and farm-price structure for specified dairy products as determined by the transportation-rate structure and sanitation regulations for fluid milk and cream.

shifting of producers from one market to another where production conditions vary to a lesser degree or perhaps even in the opposite direction.

First, consider, the position of the distributor who as the production season progresses from the season of low production to the season of high production and then back to the short season, finds him-

self with an increasing and then a decreasing volume of supplies. It would be unwise for the distributor to attempt the policy of product diversion, that is, to shift a larger proportion of the milk he receives from the fluid-milk enterprise to other dairy-product enterprises in an attempt to maintain retail prices of fluid milk. Since, by assumption, the total output of the distributor is small, relative to the entire market, and his product is not differentiated, if he endeavors to restrict his output, either by product diversion or refusing to take milk offered by a portion of his regular producers in an effort to maintain the price he receives for his product, he merely deprives himself of his market, since any competitor can, by underselling him slightly, capture his entire trade. Of course, some distributors might not be in a position to practice product diversion, since, coupled with the fact that the complex effects of daily variation in sales have not been introduced, some distributors would operate only in the zone from which fluid milk supplies are secured. Distributors in this position would be at a handicap in purchasing milk since, regardless of the effect of seasonal variation in production on prices, producers in the fluid-milk zone would receive some measure of location advantage. Furthermore, even if distributors operate in all zones and are thus able to divert fluid milk to more concentrated products, they would not gain by a policy of product diversion in order to maintain the price received for fluid milk. Their competitors would merely undersell them and capture their fluid-milk outlet; and if the distributors' resources were pushed to the margin in each enterprise, nothing would be gained by product diversion, since the prices of all products would fall or rise proportionately, and since, under the conditions assumed, product diversion would merely result in maldistribution and utilization of resources between enterprises.

Under the conditions assumed the retail prices of the various dairy products in the market would decline during the season of increasing production and increase during the season of declining production, the amount of the increases and declines depending upon the seasonal changes in the volume of milk produced and the coefficient of elasticity of demand for each product (assumed in this case to be equal and unitary). Similarly, the farm prices would follow the same general seasonal movement as retail prices. Whether the seasonal variation in farm prices would be greater than the seasonal variation in retail prices would depend upon whether distributors' margins tended to remain constant. It is likely that this would be the case, because of the probability that there are many items of expense that tend to be fixed per unit, such as transportation costs and the like. However, it is unnecessary to resolve this question since it is obvious that the seasonal variation in farm, f. o. b. city, and retail prices would be quite marked if there were significant variations in production from season to season. Also, since milk is bulky and perishable and cannot be stored, the seasonal variation in consumption would be the same as the seasonal variation in production. The same statement would hold under the assumption that the several dairy products could be stored, although this assumption was made in order to eliminate the complexity introduced by the storage of concentrated dairy products and the consequent tendency toward flattening of the seasonal variation in such prices and the shifting of farmers from the nonstorable to the storable products markets when seasonal price relationships warrant such shifts.

The milk-price structure is now considered, under the assumptions previously set forth in this section, except that the assumption that the coefficient of elasticity of demand for each of the several products is the same is discarded, and it is assumed further that shifts in sales outlets (type of product) on the part of producers can be made without friction. It is also assumed that the elasticity of demand for fluid milk and cream is less than the elasticity of demand for other dairy products.

Under the conditions above, if there were a general increase in production throughout the area, whether seasonal or otherwise, farmers would shift from the production of milk for use as fluid milk and cream to the production of milk for use in manufactured dairy products. This shift would be related roughly to the ratio of the coefficients of elasticity of demand for the different products to each other, other factors being the same. To illustrate, if the ratios were 1, no shift in utilization would occur and the prices of all products would decline by the same relative amounts. If the ratios were greater than 1, there would be a shift in the utilization of milk so that a greater proportion of the total supply would be utilized in the product having the greater coefficient of elasticity of demand. If the ratios of the coefficients of elasticity of demand for the different products were greater than 1, the price of the product having the smaller coefficient of elasticity would decline less and the price of the product having the greater coefficient of elasticity would decline more, or vice versa if production declines, than the decreases or increases indicated solely on the basis of the coefficient of elasticity of demand for each product and the increase, or decrease, in production within the areas in which the particular products would ordinarily be produced.⁷³

Thus, under the conditions assumed, the seasonal variation in retail, f. o. b. city, and f. o. b. farm prices of milk would tend to be more or less pronounced than under the conditions previously assumed, depending upon the assumptions made with respect to the elasticity of demand for the different products. This would be true especially in those cases where the proportion of milk used in the production of manufactured dairy products is small in relation to the entire market for such products and where the elasticity of demand for milk is less than for other dairy products, so that a large increase in the production of manufactured dairy products within the area under consideration would have little effect upon the total volume of such products in the entire market, and hence little effect upon the market price. Furthermore, if the assumption that manufactured dairy products cannot be stored is discarded, it appears that the seasonal variation in milk prices would be somewhat less than in the two cases treated previously. Insofar as the storage of manufactured dairy products during the flush production season and the movement of such storage stocks into consumption during the season of low production result in any diminution of the seasonal variation in prices from that which would obtain otherwise, the seasonal variation in retail, f. o. b. city, and farm prices of milk will tend to be reduced from what it would be if manufactured dairy products were not storable.

⁷³It should be noted in this connection that transportation costs and other fixed items of handling expense probably represent a larger proportion of the f. o. b. market price of milk than of other dairy products, hence the inelasticity of the farm-price quantity curve for milk used as fluid milk as compared to farm prices of milk used for other dairy products will probably be greater than that indicated on the basis of market-demand schedules for the several products.

It should be noted that distributors are not in a position to practice product diversion, for the reasons set forth previously. Hence during the season of heavy supplies, retail prices would be low, and, conversely, they would be high during the season of short supplies, in relation to average annual retail prices. The seasonal variation in the farm prices of milk would follow the same general seasonal variation as that exhibited by retail prices.

The assumption that shifts in sales outlets by producers can be made without friction is now dropped. Under these conditions the fact that it may be quite difficult for producers to shift their milk from one sales outlet (type of product) to another tends to cause the seasonal variation in milk prices to be more pronounced than when such shifts can be made without friction. Since the former case probably prevails more generally than the latter it is to be expected that, under conditions of simple competition, the seasonal variation in retail, f. o. b. city, and farm prices of milk would be quite marked, provided there was a significant seasonal variation in milk production. The degree of seasonality in milk prices in any particular area would depend upon the seasonal variation in production within the area, the coefficient of elasticity of demand for each of the products, the relative sizes of the market for the different products, and the degree to which producers could shift from one sales outlet (type of product) to another.

When the assumption that quality requirements are uniform with respect to milk used in the production of all products is dropped, the effect of seasonal variation in production upon prices is even more difficult to determine. On the whole it appears that, if the requisite volume of milk qualified for distribution as fluid milk is to be forthcoming, prices received per unit must be sufficiently above prices received per unit of manufacturing milk to cover the additional costs of production occasioned by the more stringent quality requirements applicable to milk produced for use as fluid milk. However, it is difficult to ascertain how this additional price per unit would have to be forthcoming on a seasonal basis. Producers probably would not incur the cost of erecting the durable items of capital equipment if they expected to be "in and outers", i. e., fluid-milk producers during part of the year and manufacturing-milk producers during the remainder of the year, unless they could be sure that their gains during the period of the year when they were selling fluid milk would compensate them for the costs of maintaining their farm equipment at the point necessary in order that they be eligible to supply the market with fluid milk. If this were the case, however, it appears that prices would have to be considerably higher per unit during the short season of the year than if producers were able to cover at least their prime additional costs during the flush period and sell their milk to fluid-milk distributors during the entire year. As a matter of fact, producers encounter a great deal of difficulty in shifting from one sales outlet to another, and while this is a deviation from the assumptions necessary for competition to be perfect it does not mean that producers are not operating under conditions of simple competition. As long as the producers' output is small relative to the volume supplied the market and the product of different producers is not differentiated in any manner, the requirements of simple competition are met. Thus if (1) the seasonal variation in milk production is quite marked, (2) producers encounter friction in shifting from one sales

outlet (type of product) to another, and (3) the demand for milk is more inelastic than the demand for manufactured dairy products, prices to producers supplying fluid milk to the market would decline markedly during the season of flush production, and might decline to the point where even prime additional costs would not be covered. While this may appear unreasonable, the producer might draw on reserves for a short period, such as the seasonally heavy production period. In any case, since the matter under discussion is the seasonal movement of prices in a position of general equilibrium relative to the annual prices of milk, the producer would have to secure prices high enough during the short season to cover any losses incurred during the flush period. On the whole it appears that, under the conditions assumed, the introduction of varying quality requirements with respect to milk produced for use in the several dairy products, with more stringent quality requirements applicable to milk produced for use as fluid milk, would tend to increase the seasonal variation in retail, f. o. b. city, and farm prices of milk produced for use as fluid milk, relative to the seasonal variation in the prices of milk produced for use in manufactured dairy products.

As was noted previously, changes in supply from day to day are probably small and also are probably in the nature of an increasing or decreasing seasonal trend which is a function of the seasonal variation in supplies. Therefore, it appears that daily retail prices of milk would vary inversely to the increase, or decrease, in daily supplies, being in the nature of a daily trend in prices that would be a function of the seasonal trend in prices.

II. THE PRICE STRUCTURE OF THE MILK MARKET FOLLOWING CHANGES IN THE MARKET SITUATION

Attention is now devoted to an analysis of the general nature of the changes in the price structure in the market following changes in important factors in the general market situation.⁷⁴ In order to simplify the analysis, only milk and butter are considered, similar conclusions following if other products, such as cheese and evaporated milk, are included. It is assumed that milk needed for fluid cream would be shipped to the market as milk and that the price for this purpose at the market would be the same as that of fluid milk.

It has been shown that the fundamental factor governing the outer edge of the milk-supply area in relation to the butter-supply area for a particular market, under conditions of decentralized processing, uniform quality requirements, and isolated price-determining market conditions, is the relative costs of transporting fluid milk and butter. The equilibrium position at any time is such that producers located at the zone dividing the milk production region into two areas, one supplying fluid milk and the other butter, are indifferent to shipping milk in fluid form or to separating the cream and making it into butter.

If the cost of converting milk into butter and of preparing milk incident to shipping it to the market is disregarded and the supply area is assumed to be a circle surrounding the market, then the equilibrium position at the boundary of the market is given by the equation⁷⁵

$$P_f - T_f R = P_b - T_b R \quad (1)$$

⁷⁴ The theory in this section is applicable, except for certain modifications which will not be developed fully, to complex as well as simple markets, i. e., to conditions of complex as well as simple competition.

⁷⁵ The authors are indebted to Mr. Leon J. Steck, associate agricultural economist, Dairy Section, for the development of the formulae, and to Dr. Warren C. Waite of the University of Minnesota, who aided in the development of the theoretical aspects of the problem given in this section.

where P_f is the price of 100 pounds of fluid milk at the market; P_b the price of the butter equivalent of 100 pounds of milk at the market; T_f the cost of transporting 100 pounds of milk a unit of distance; T_b the cost of transporting the butter equivalent of 100 pounds of milk per unit of distance; and R the distance to the outer edge of the milkshed.

1. Changes in transportation costs.—It is evident that transportation costs are an important element in determining the supply area for fluid milk and that changes in the transportation rates must produce significant effects upon the price structure of the market.⁷⁶ Suppose, for example, that, following a decrease in transportation charges for milk, transportation charges for butter remaining the same, the price of fluid milk at the market was artificially maintained at the old price. The distance from which it would be profitable to draw fluid-milk supplies would then be greater. If the milkshed were circular the radius would be extended in a somewhat greater proportion than the decrease in transportation costs, since the alternative value in the butter use is lower at the edge of the expanded milk area.⁷⁷ The area of a circle also increases more rapidly than its radius, and the added territory is greater in proportion to the old territory than the proportionate increase in the radius. If supplies are uniformly produced over the entire area, a reduction of transportation costs of fluid milk, if prices at the central market were maintained, would expand the possible volume of receipts in a considerably larger proportion than the relative reduction in transportation costs. It is evident that any marked change in transportation costs must force a considerable readjustment of the price structure of the market.

For example, assume a market in which an equilibrium has been established with fluid milk drawn from a circular surrounding area with a radius of 80 miles, with a central market price of \$2 per hundredweight for milk. Transportation costs are assumed to be 0.2 cent per mile per hundredweight for milk and 0.005 cent per mile for the butter equivalent of 100 pounds of milk. The milk equivalent price of butter in the market is \$1.844 per hundredweight. A decrease of transportation costs of fluid milk from 0.2 to 0.1 cent per mile per hundred pounds, if the central market price remained at \$2 per hundredweight for fluid milk and \$1.844 for the milk equivalent price of butter, would expand the radius of the surrounding potential milk area from 80 to 164.2 miles; and if milk were uniformly produced over the area, the potential supply would be increased by about 4.2 times. (See fig. 20.)

In the equilibrium situation the difference in the price of fluid milk per hundred pounds at the market and the milk equivalent value of 100 pounds of milk in butter at the market center may be expressed as the difference in transportation cost of the two products over the distance of the radius of the circle including the area of the higher priced product.⁷⁸ A decrease in the transportation cost for fluid milk must operate, in consequence, to decrease the spread between the price of fluid milk and the milk equivalent value of butter at the market center. The decrease will be greater the larger the area covered in

⁷⁶ See sec. I, 2, of this chapter.

⁷⁷ Formula (1) may be rewritten as:

$$R = \frac{C}{T_f - T_b} \text{ where } C = P_f - P_b.$$

Since T_b is subtracted from T_f the value of $T_f - T_b$ will show greater proportional changes than T_f .

⁷⁸ Formula (1) may be rewritten as $P_f - P_b = R(T_f - T_b)$.

procuring the milk and the greater the decrease in transportation cost.

If the market remained the same in area, following the decrease in transportation rates, then the spread between the fluid-milk price and the value of the milk equivalent manufactured into butter decreases proportionately more than the change in the transportation rate for fluid milk.⁷⁹ The fluid-milk price itself changes in a somewhat smaller proportion. In a market having the same original equilibrium as that assumed in the previous problem, the central market price for fluid milk would become \$1.92 per hundredweight and the differential between fluid milk and the milk equivalent of butter would drop from 15.6 cents to 7.6 cents. The demand for milk, however, probably is not absolutely inelastic, nor are the inlying producers likely to continue to produce the same volumes at the lower price as before, and in consequence the production area may be expected to expand. The new equilibrium position cannot be precisely demonstrated without assumptions with respect to the supply reactions. It would appear, however, that the inlying producers would suffer lower prices, the

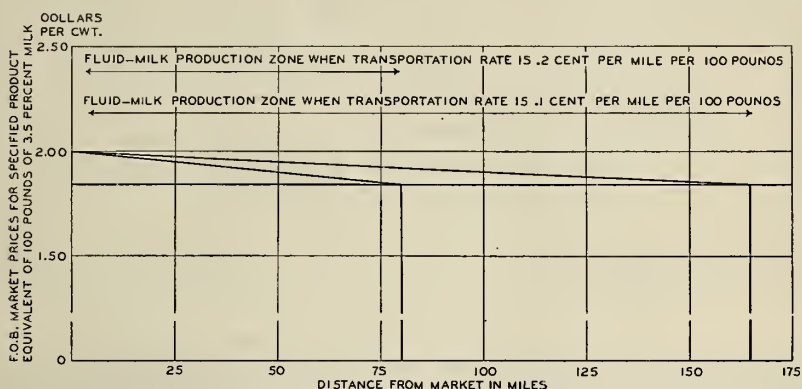


FIGURE 20.—Change in production zones and farm-price structure following a decline in transportation costs where central-market prices are unchanged.

present outlying producers would gain slightly higher prices, while some newcomers would be drawn to the market as producers from an expanded territory. (See fig. 21.)

Changes in transportation rates, because of their direct connection with certain elements in the price structure, are thus responsible for important changes in that structure. Once rates are reduced, if the attempt is made to maintain prices, the supply area may be expanded several times in proportion to the decrease in rates. However, when equilibrium is reached, unless nearby producers have greatly reduced production the spread between fluid-milk prices and the milk equivalent value of butter at the central-market prices will have decreased about in proportion to the decline in transportation costs. The supply area for fluid milk will be expanded in a somewhat smaller proportion, inlying producers will have suffered price decreases

⁷⁹ Formula (1) again rewritten as $\frac{P_f - P_b}{T_f - T_b} = R$.

R is now assumed constant, and since the relative change in $T_f - T_b$ is greater than the change in T_f , the change in $P_f - P_b$, which is proportional to $T_f - T_b$, must also be greater than the change in T_f .

and outlying producers small declines or increases, the extent depending upon the expansion of the fluid-milk area. Increased transportation rates would, of course, have just the contrary influences.

2. Changes in supply.—Any factor operating to alter the output of milk in the milk production region will probably affect the location of the milk zone and influence the price structure for milk in the market. Two different sorts of changes in supply are noted: The first, more or less localized in the particular milkshed with the price of butter remaining unchanged, or changing only slightly; and the second, a general change including not only the particular milkshed but extending over the butter area as well and changing the level of butter prices. The results of a general change will evidently be more marked on prices than one restricted to the individual market territory since the latter involves only a shift in the milk area, with a slight change in butter prices, while the former involves a similar shift in the area plus the changes induced by the changed level of butter prices.

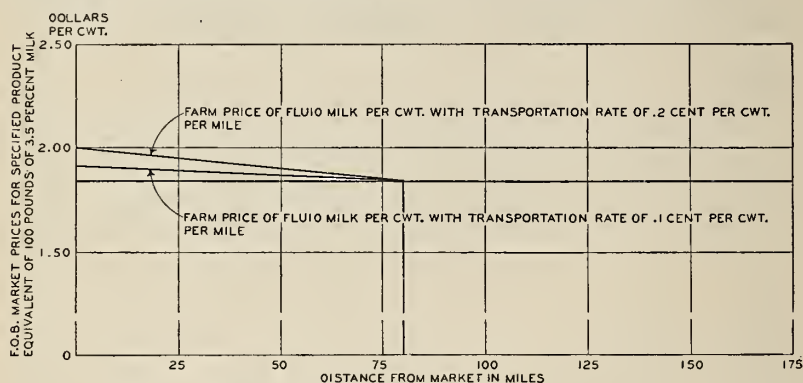


FIGURE 21.—Change in price structure of milk zone following a decline in transportation costs with production zone and volume of production remaining unchanged.

Suppose that there is a uniform increase of 2 percent in the supply from the fluid-milk area with an 80-mile radius, where an equilibrium has been reached with a \$2 per hundredweight price for fluid milk at the market center and with a milk equivalent value of the milk in butter at \$1.844. If all the supply is brought to the market center the price of fluid milk would fall to approximately \$1.92, if the coefficient of the elasticity of demand is assumed to be -0.5 .⁸⁰ At this price, however, it would not be profitable to ship milk from 80 miles if the \$1.844 milk equivalent value for butter at the market center continued, and as rapidly as possible outlying shippers would divert their shipments from the fluid-milk market to the now more profitable

⁸⁰ The fundamental equation governing the relationship between a change in supply and price in the market may be expressed as

$$\frac{P_f - P_f'}{P_f} = \frac{1}{e_f} \cdot \frac{S_f - S_f'}{S_f} \quad (2)$$

where P_f is the initial price at the market of 100 pounds of milk; P_f' the final price; S_f the initial supply of milk and S_f' the final supply; and e_f the coefficient of elasticity of demand for milk at the market. This expression is not exact since it deals with finite rather than infinitesimal differences, but the divergence is insignificant in ordinary problems. Solving for P_f'

$$P_f' = P_f \left(1 - \frac{1}{e_f} \cdot \frac{S_f - S_f'}{S_f} \right) \quad (3)$$

butter market. If production is assumed uniform over the entire area, adjustment would be reached by a reduction in the total area of slightly less than 2 percent, less because of the somewhat larger quantity salable at a lower price. This would mean considerably less than a 2-percent reduction in the radius of the market area, and in consequence the differential between the price of fluid milk at the market and the milk-equivalent value of butter at the central market would decline much less than 2 percent. With a coefficient of elasticity of demand of -0.5 assumed for market milk, the equilibrium would be reached with a market area with a radius of 79.2 miles and a central-market price for fluid milk of \$1.998.⁸¹ (See fig. 22.)

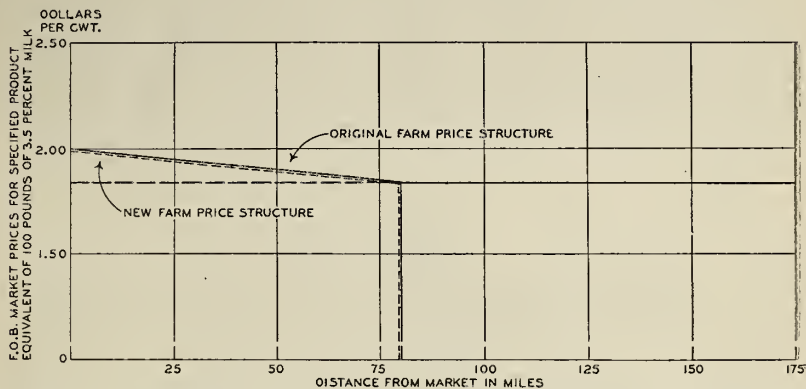


FIGURE 22.—Adjustment of production zones and farm price structure for specified dairy products following a 2-percent increase in the production in the fluid-milk zone.

If the increase in supply is general, occurring not only in the milkshed in question but in the butter area as well, the results of the increase upon price will be much more marked than in the former example. If it is assumed that the coefficient of elasticity of demand for butter is -1.0 and that butter will be brought to the market from an area with a radius of 200 miles, with the same original equilibrium as in the last example and a uniform 2-percent increase in supply, the new equilibrium would be reached with a fluid milk supply area with a radius of 79.6 miles and a fluid milk price of \$1.959 per hundred-

⁸¹ Formula (3) in footnote 80 may be expressed as

$$P'_f = P_f \left(1 - \frac{1}{\epsilon_f} \cdot \frac{Y R^2 - Y' R'^2}{Y R^2} \right) \quad (4)$$

where Y is the output of milk per unit of area, R the initial distance from the market to the outer edge of the milk-supply area, and R' the final distance. The new price of milk is also

$$P'_f = P_b + (T_f - T_b) R'$$

so

$$P_f \left(1 - \frac{1}{\epsilon_f} \cdot \frac{Y R^2 - Y' R'^2}{Y R^2} \right) = P_b + (T_f - T_b) R'$$

from which the following expression for R' is secured

$$R' = \frac{T_f - T_b \pm \sqrt{(T_f - T_b)^2 - 4 \frac{Y'}{Y} \left(\frac{P_f}{\epsilon_f} \cdot \frac{1}{R^2} \right) \left(P_f - P_b - \frac{P_f}{\epsilon_f} \right)}}{2 \frac{Y'}{Y} \cdot \frac{P_f}{\epsilon_f} \cdot \frac{1}{R^2}}$$

weight in the central market and \$1.804 for the milk equivalent value of butter.⁸² (See fig. 23.)

With a uniform increase in production in the butter-supply area and the fluid-milk area for a market and with no change in these areas, the price of fluid milk would fall more than the price of the milk equivalent of butter because of the differences in the elasticity of demand for the two products. The more inelastic the demand for milk is, in relation to the demand for butter, the greater the difference. The greater decline in fluid-milk prices than in butter prices would tend to produce some shift in the fluid-milk area to the area producing butter and some lessening of the former margin between the two. The absolute fall in the price of milk would be greater than that of the milk equivalent of butter. Territory may be shifted more easily from fluid milk to butter the smaller the absolute difference between them in the transportation costs per mile. In consequence, low transportation costs for milk in relation to those for butter lessen the lowering of the central-market price following an increase in supplies.

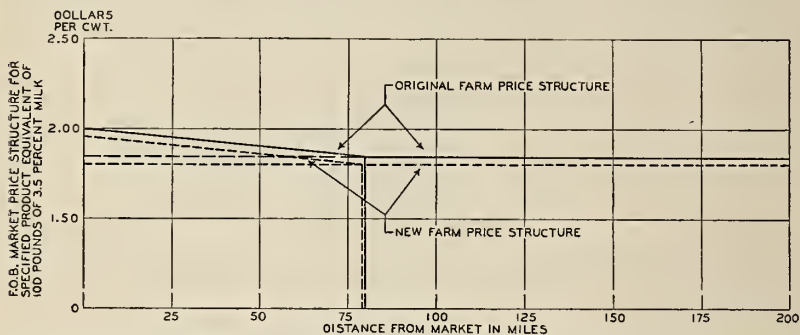


FIGURE 23.—Adjustment of production zones and farm price structure for specified products following a 2-percent increase in supply in the fluid-milk and butter-production zones.

3. Changes in demand.—A change in the demand for fluid milk in the market will, of course, operate to change the location of the milk-supply area and the price structure of the market. These changes in the price structure occasioned by changes in demand are opposite to, but of about the same magnitude as, changes of the same amount in supply. This is because a given percentage increase in supplies has approximately the same effect upon price as the same percentage decrease in demand, and vice versa, when the demand curve is assumed

⁸² An expression similar to that for fluid milk for the new equilibrium price for butter is as follows:

$$P'_b = P_b \left(1 - \frac{1}{\epsilon_b} \cdot \frac{Y(R_0^2 - R^2) - Y'(R_0^2 - R'^2)}{Y(R_0^2 - R^2)} \right)$$

where ϵ_b is the coefficient of elasticity of demand for butter and R_0 , the distance from the market to the outer edge of the butter-supply area. Substituting as before, the following expression is obtained:

$$P_f \left(1 - \frac{1}{\epsilon_f} \cdot \frac{Y R^2 - Y' R'^2}{Y R^2} \right) = P_b \left(1 - \frac{1}{\epsilon_b} \cdot \frac{Y(R_0^2 - R^2) - Y'(R_0^2 - R'^2)}{Y(R_0^2 - R^2)} \right) + (T_f - T_b) R'$$

from which the following expression for R' is obtained:

$$R' = \frac{(T_f - T_b) \pm \sqrt{(T_f - T_b)^2 - 4 \frac{Y'}{Y} \left(\frac{P_f}{\epsilon_f} \cdot \frac{1}{R^2} + \frac{P_b}{\epsilon_b} \cdot \frac{1}{R_0^2 - R^2} \right) \left[P_f \left(1 - \frac{1}{\epsilon_f} \right) - P_b \left(1 - \frac{1}{\epsilon_b} + \frac{1}{\epsilon_b} \cdot \frac{Y'}{Y} \cdot \frac{R_0^2}{R_0^2 - R^2} \right) \right]}}{2 \frac{Y'}{Y} \left(\frac{P_f}{\epsilon_f} \cdot \frac{1}{R^2} + \frac{P_b}{\epsilon_b} \cdot \frac{1}{R_0^2 - R^2} \right)}$$

to have the same elasticity throughout the section of the curve involved and to have retained the same elasticity when it shifts.

For example, assume again a market with a \$2 central-market price for 100 pounds of fluid milk and \$1.844 for the milk equivalent of butter, with milk drawn from an 80-mile radius and butter from an area between the 80-mile fluid-milk area limit and a circle with a radius of 200 miles. The coefficient of the elasticity of demand for butter is assumed to be -1.0 and for fluid milk -0.5 . If there is a 2-percent decrease in the demand for fluid milk in this market with the demand for butter remaining unchanged, a new equilibrium would be reached with a price of \$1.992 for fluid milk per hundredweight and \$1.838 for the milk equivalent of butter, with the edge of the milk supply area now at 79.3 miles.⁸³ There is some difference between these results and the example shown for a similar market in which there had been an increase of 2 percent in supply, but this is occasioned by differences in the assumptions. In case of the decrease in demand it was assumed that supplies were drawn only from an area of 200 miles, and the transfer from the milk area accordingly increased butter supplies and lowered prices. In the supply-increase problem it was assumed that the butter area was not limited, so that the milk area was relatively small in comparison to it, and the transferred area had no appreciable influence on butter prices.

If the decrease in demand had been for butter rather than for fluid milk, the milk-equivalent value of butter would have been lower and some milk formerly sold for butter purposes would have been diverted to the production of fluid milk, with a resulting increase in supplies and a lower fluid-milk price in the central market. The increased milkshed would mean a greater differential between the price of fluid milk and the milk equivalent of butter. Both prices would decline, with the milk equivalent of butter having the greater fall.

4. The adjustment period.—The preceding sections have shown that changes in transportation rates, in production in the area, and in demand, if maintained, will tend to lead to a readjustment in the market areas and prices and result in a new equilibrium and price structure in the market. The time required for the adjustment depends upon the ease with which the producers in the transferred area are able to shift from one utilization of milk to the other, as well as the ability of producers to expand or contract their production or to shift to other enterprises.

One of the factors involved in a shift in utilization is the ready accessibility of plants equipped to handle the product in the alternative outlet. These possibilities differ greatly between markets.

Sanitation requirements may be an important factor in the time required for the adjustment of the market to a new equilibrium. It has been shown in section I, 3, of this chapter that special sanitation requirements for fluid milk lead to an additional differential between fluid milk and the milk equivalent value of the other products at the central market above the differential occasioned by the difference in

⁸³ The formulae for changes in demand are

$$R' = \frac{(T_f - T_b) \pm \sqrt{(T_f - T_b)^2 - 4 \left(\frac{Y}{Y'} \cdot \frac{P_f}{e_f} \cdot \frac{1}{R^2} + \frac{P_b}{e_b} \cdot \frac{1}{R_0^2 - R^2} \right) \left[P_f \left(1 - \frac{1}{e_f} \right) - P_b \left(1 - \frac{1}{e_b} + \frac{1}{e_b} \cdot \frac{R_0^2}{R_0^2 - R^2} \right) \right]}}{2 \left(\frac{Y}{Y'} \cdot \frac{P_f}{e_f} \cdot \frac{1}{R^2} + \frac{P_b}{e_b} \cdot \frac{1}{R_0^2 - R^2} \right)}$$

transportation costs, and that this difference is also present at the edge of the milk zone. If the additional expense involved in preparation for meeting the sanitation requirements is in the nature of a fixed investment, shifts between fluid milk and other uses will be considerably curtailed. Butter producers will be hesitant in shifting to the fluid milk market until they can assure themselves that the new situation is likely to be favorable for a sufficient length of time to cover the costs of the additional outlays. Producers who have organized themselves to meet the sanitation requirements will not find it profitable to change to butter production until the price has fallen the full amount of the fixed costs involved in meeting these requirements. For example, suppose the fluid-milk price in the central market to have declined because of a decrease in demand or increased supplies. If there were no special sanitation requirements for fluid milk it would at once be profitable for the outlying producers to shift to other utilizations of their milk. If, on the other hand, there are sanitation requirements assumed to amount to additional expenditures of 20 cents per hundredweight, prices must fall by 20 cents per hundredweight before it becomes desirable for even the outlying producer to divert milk to other outlets. Sanitation requirements tend to maintain the milkshed in its original size and prevent adjustments, thus tending to intensify and prolong maladjustments in the price structure.

5. *Application of the formulae.*—It should be noted that the equations given in the foregoing pages of this chapter were developed in relation to isolated price-determining market conditions. The formulae do not take into consideration the matter of alternative opportunities available to producers in other lines of production, this matter being handled by an assumption regarding the actual increase or decrease in supplies.

At any given time the enterprises found on any particular farm stand in a sort of balance. Farmers, endeavoring to make the most profitable utilization of the productive facilities available to them, tend to push production in each enterprise to the margin, that is, to the point where any additional unit of input of the factors of production in any particular enterprise will yield the same money return as if it had been employed in any other enterprise available to them, or, stated differently, where the removal of a unit of the factors of production from one line will occasion as much decline in money returns as the utilization of such unit in another enterprise would add to money returns. Hence with any given change in the price of the product of one enterprise relative to another, farmers will tend to decrease their inputs of the factors of production in the enterprise, the price for which has fallen, and increase the inputs in the other enterprise with respect to which the price of the product has fallen relatively less than the product in question, stayed constant, or risen.

Thus the formulae given are of value in the theoretical treatment of the problem but are attenuated in their applicability, since the supply response to changing economic conditions is not brought within the scope of the formulae.

Thus far there has been presented a general theory of milk prices in simple markets. The discussion now progresses to the development of the general theory of milk prices in more complex types of markets than those treated previously.

III. THE GENERAL THEORY OF MILK PRICES IN MARKETS WHERE DISTRIBUTORS ARE LARGE, PRODUCTS ARE DIFFERENTIATED, AND PRODUCERS ARE SMALL AND UNORGANIZED

The previous sections of this chapter have been largely concerned with the development of a theory of milk prices in simple markets. The conditions that are necessary or that are a function of this type of market are: (1) That producers and distributors (sellers) be so small that their output and changes therein have little influence on market price, and (2) that products be homogeneous. The discussion now turns to the development of a theory of milk prices in markets where producers are small and unorganized, and the milk produced by any of them is directly comparable with that of other producers, and where distributors are large and their products differentiated to a greater or lesser degree. Such markets are more complex than those treated previously. The producers in this phase of the analysis may be said to be operating under conditions of simple competition, while the distributors may be said to be operating under conditions of complex competition.⁸⁴

1. **Size of business of milk distributors and product differentiation in the milk trade.**⁸⁵—One of the major characteristics of an industry, wherein prices may be said to be determined under conditions of complex competition is that of large-size businesses relative to the total market. In many industries several firms may be so large that they handle the larger portion of the entire volume of output of the industry. As far as the distributive phase of milk marketing in many milk markets is concerned, several large distributors handle the larger portion of the business. The facts with respect to this matter were indicated in chapter 2, and it would appear that one of the major conditions necessary for the milk price structure to be determined under conditions of complex competition has been shown to exist in milk markets. Attention is now directed to a consideration of whether another important attribute of complex competition, product differentiation, is to be found in milk markets.

In a market operating under conditions of simple competition it is necessary that the product offered by different sellers be strictly homogeneous, else buyers and sellers will not be associated in random fashion but on the basis of preference for the goods of one seller as compared to another seller, on account of certain attributes possessed by the one and lacking in the other.⁸⁶

Thus a seller producing a differentiated product has to consider the price at which different volumes of output will sell, his costs of producing such different outputs, and whether or not it is feasible to differentiate his product to a greater or lesser degree. When the

⁸⁴ The term "complex competition" is substituted for the more usual term "monopolistic competition" in this treatise in order to focus attention on the character of the competition in milk marketing without introducing confusion by the use of a term with respect to which there may be preconceived ideas that lead to bias in the consideration of milk problems.

⁸⁵ Since it is not the purpose of this treatise to develop further the theory of value under conditions of complex competition, readers desiring a more complete treatment of the theory of value under conditions of complex competition are referred to Chamberlin's *Theory of Monopolistic Competition* and Joan Robinson's *Economics of Imperfect Competition*.

⁸⁶ "A general class of product is differentiated if any significant basis exists for distinguishing the goods (or services) of one seller from those of another. Such a basis may be real or fancied, so long as it is of any importance whatever to buyers, and leads to preference for one variety of the product over another. When such differentiation exists, even though it be slight, buyers will be paired with sellers, not by chance and at random (as under pure competition), but according to their preferences." Chamberlin, Edward, *Theory of Monopolistic Competition*, ch. IV, p. 56. Presumably, Chamberlin uses the phrase "significant basis" in establishing the importance of product differentiation, i. e., slight differentiation, slight divergence from competitive results; a high degree of differentiation, a large difference from competitive results.

products are differentiated it is probable that competition is no longer simple but highly complex. There is no one general market to be analyzed but a series of markets more or less closely related, the closeness of the relationship depending upon whether the various products in the general category may be readily substituted for each other. Attention is now directed to ascertaining whether distributors follow the practice of product differentiation in selling milk. The matter of how such product differentiation may affect the price of milk is left for consideration after ascertaining whether such practices as result in product differentiation actually exist in milk markets. Data are lacking in regard to many important points, but several of the practices that are of a character that differentiates the product can be noted readily.

Distributors may differentiate their product from the rest of the milk in the market by several methods, such as increasing the butterfat content of their milk, taking special care with respect to the cleanliness of their product, selling special grades of milk, selling different style packages, i. e., packages which, through appearance or some other special characteristic, are preferred by some consumers, using brands and trade-marks, rendering special services to customers, etc.

Some consumers desire milk of fairly high butterfat content. Thus certain consumers will prefer the milk of the distributor who follows a policy of distributing high-test milk. This one factor operates to set up a market within a market, so to speak, and is certainly inconsistent with the conditions of simple competition. Under conditions of simple competition the distributor could sell as much or as little as he wished without following a policy of product differentiation. Insofar as he is able to cater to the demands of a certain group of consumers, and thereby segregate his market to a greater or lesser degree from that of his rivals, his price, his product (in this case, high butterfat content of the milk he sells), and his costs, both cost of production and cost of selling, must be considered in arriving at that particular combination of the items noted which will result in maximum profits (or minimum losses). Thus, inasmuch as the test of milk is a factor in influencing consumers to purchase from one distributor rather than another, the differentiating distributor may increase his sales at the accepted market price, partly at the expense of his competitors and partly through turning consumers' interest in favor of milk as such in comparison with other goods, or maintain his price at a higher level than that generally prevailing in the market, or both. On the whole, however, it is probable that the matter of butterfat content is of limited significance in product differentiation with respect to milk distribution. In the first place, it is a practice that can be followed fairly readily and if competitors retaliate by raising the butterfat content of their milk the product, insofar as the matter of butterfat content is concerned, is no longer differentiated. In the second place, a distributor, by putting out a high-test milk, probably not only raises his costs, including raw material, but may reduce his customers' demand for cream. In the latter case it would appear that the distributor would need to consider his gains in sales revenue from milk as compared to his loss in sales revenue from cream. This is a rather devious problem which need not be considered further here.

Another method of product differentiation is that of stressing the cleanliness of the milk distributed. Distributors having a reputation for sanitary milk are in the same category as those who differentiate through any other means, although not necessarily in the same degree. Stated differently, such distributors are able to distinguish their product from that of the general market, and are thus able to exert considerable effect upon the price of their product. Under conditions of simple competition it has been shown that such procedure would be impossible. The same considerations hold true for such types of product differentiation as specialty products, specialty packages, and the like. These types of product differentiation perhaps have more merit if associated with trade-marks or brands which are advertised on the basis of the superior merit attaching to the products so identified. Again, data are not available to indicate the extent and efficacy of the various methods of product differentiation described above.

Perhaps the most important method of product differentiation is based on the type of service rendered consumers and the canvassing carried on by route men. Consumers become attached to (or mayhap prejudiced against) the route man, since in many cases he is their only contact with the firm. That this factor is important is disclosed by the fact that distributors are often loath to change men from route to route, or to discharge them, for fear that they will take their customers' trade with them when hired by another company, or start a small route of their own with the former route as a nucleus. This factor is also inconsistent with the conditions of simple competition, since, with a homogeneous product, i. e., homogeneous in the sense that all attributes of the product, its content, the manner of delivery, etc., are standardized, there would be little basis for differentiating the product on the basis of service, since distributors could sell as much or as little as they pleased at the going market price without changing or deviating from the ruling standard of service.

Selling expenditures, such as advertising, commissions of milk route men for selling a volume larger than some base volume (that is, in some instances, the route men are paid a salary and, in addition, are given a commission for sales above a specified volume), salaries of salesmen, sales managers, etc., are in themselves inconsistent with the conditions necessary for the price structure for milk to be determined under conditions of simple competition, i. e., a homogeneous product for the market, and with numbers of distributors sufficiently large that the volume of business of any one of them, in relation to the total volume of such business in the market, is so small that it has no practical effect on market prices.⁸⁷

Milk distributors, at least some of them in practically every market, make fairly large outlays for advertising. Various media are used, such as newspapers and streetcar posters. Little data are available

⁸⁷ "In the explanation of why selling expenditures are inconsistent with the assumption of pure competition both of its requirements—a standardized product and a large number of competitors—play their part. Product being standardized, there is no basis for distinguishing one seller's goods from those of another. No one, therefore, could take business from his competitors by advertising; on the contrary, his goods being indistinguishable from theirs, he would be forced to increase or diminish their sales *pari passu* with his own. Now, the number of competitors being large, anyone is a correspondingly small factor in the whole situation. An advertising expenditure very large to him would have a very small effect on the total demand, and his own increase would be a negligibly small fraction of this. Wherever conditions of pure competition exist, this reasoning is clearly supported in fact. A single wheat farmer or a single orange grower does not advertise to increase the consumption of his product." Chamberlin, Edward, *Theory of Monopolistic Competition*, cb. VI, p. 127.

relative to the actual amount of advertising expenditures in milk markets. Mortenson, in a study of distributors' costs and profits (based on records of 10 firms), found that advertising constituted a significant outlay for the distributors whose records were studied. Thus of the total operating costs of the 10 companies studied, 4.4 percent represented outlays for advertising in 1927, with a decline to 2.4 percent in 1932. (See table 29.)

TABLE 29.—*Division of distributors' operating costs in percent of total operating costs (10 milk companies in Wisconsin)*

Cost items	1927	1928	1929	1930	1931	1932
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Wages.....	39.6	41.1	41.9	42.5	42.9	43.8
Salaries.....	11.4	10.7	10.0	10.5	11.4	10.2
Depreciation.....	9.9	9.6	10.0	9.5	8.8	9.2
Bad debts.....	1.2	1.4	1.9	1.8	1.6	3.8
Taxes.....	2.9	3.7	3.1	3.2	3.2	3.2
Advertising.....	4.4	4.2	3.9	2.9	3.2	2.4
All other (including supplies, repairs, water, light, power, etc.).....	30.6	29.3	29.2	29.6	28.9	27.4
Total operating cost.....	100.0	100.0	100.0	100.0	100.0	100.0

Compiled from Mortenson, W. P., *Economic Considerations in Marketing Fluid Milk*, University of Wisconsin Research Bulletin No. 125, table 17, p. 34.

Data set forth in the study entitled "A Survey of Milk Marketing in Milwaukee", indicate that advertising costs comprise a significant item of expense, especially in relation to total selling expenses. Also, there are significant variations between the relative importance of such expenses incurred by different sized concerns. Thus in 1933 advertising expense amounted to 0.065 cent per quart of milk receipts, or 37.4 percent of total selling expense⁸⁸ of two large companies considered to be fairly representative of their size group. Comparable figures for two medium-sized firms within the same year were 0.062 cent per quart of milk receipts, or 72.1 percent of total selling expenses.

For two small firms, advertising was the only item definitely classified as selling expense and amounted to 0.027 cent per quart of milk receipts.⁸⁹ (See table 30.) It must be borne in mind that these figures refer to advertising expenses per quart of milk received; hence, they are spread over a considerable volume of surplus (manufactured) products and, if applied to fluid milk, would be larger per quart of milk sold in fluid form.

TABLE 30.—*Composition of selling expense per quart of milk receipts incurred by selected distributors in the Milwaukee, Wis., market, 1933*

Expense items	2 large firms		2 medium-sized firms		2 small firms		Average 6 firms	
	Cents per quart	Per cent	Cents per quart	Per cent	Cents per quart	Per cent	Cents per quart	Per cent
Salaries and commissions.....	0.074	42.5	0.024	27.9	-----	-----	0.069	42.4
Advertising.....	.065	37.4	.062	72.1	0.027	100.0	.064	38.8
Stationery, printing, and postage.....	.009	5.2	-----	-----	-----	-----	.008	4.9
Telephone and telegraph.....	.005	2.9	-----	-----	-----	-----	.004	2.4
Auto expense.....	.006	3.4	-----	-----	-----	-----	.005	3.0
Credit and collections.....	.012	6.3	-----	-----	-----	-----	.012	6.1
Miscellaneous.....	.003	2.3	-----	-----	-----	-----	.003	2.4
Total.....	.174	100.0	.086	100.0	.027	100.0	.165	100.0

Compiled from A Survey of Milk Marketing in Milwaukee, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration, p. 60.

⁸⁸ Total selling expenses are composed of salaries and commissions, telephone and telegraph; stationery, printing, and postage; auto expense, advertising, credit and collections expense, subscriptions and dues, and miscellaneous.

⁸⁹ See also Federal Trade Commission, Sales and Distribution of Milk and Milk Products, H. Doc. No. 387, 74th Cong., 2d sess., pp. 69-77.

Advertising is only one, probably minor, among a number of costs that are incurred in differentiating a product. The soliciting of route men, extra costs incurred in furnishing superior service, salaries and commissions of salesmen, extra packaging costs associated with specialty packages, etc., must all be included. Chamberlin states that, in the matter of distinguishing between costs of production and costs of selling, "A simple criterion is this: Of all the costs incurred in the manufacture and sale of a given product, those which alter the demand curve for it are selling costs, and those which do not are costs of production."⁹⁰ Again, "We arrive at another way of stating the distinction between the two kinds of costs: Those made to adapt the product to the demand are costs of production; those made to adapt the demand to the product are costs of selling."⁹¹

It is a rather difficult matter to ascertain whether certain costs incurred are costs of selling or costs of production. For example, a certain portion of the time of route men may be spent in delivering the product, another portion in soliciting business. Part of the time spent in processing and packaging the product is undoubtedly chargeable to costs of selling, insofar as the processing and packaging result in any differentiation of the product from the general type of product in the market. In addition, a perplexing question is raised as to whether retail delivery, and hence retail delivery costs, are not either entirely or at least partially inconsistent with the conditions necessary for the milk-price structure to be determined under conditions of simple competition. Offhand, it would appear that retail delivery of milk is inconsistent with the assumptions of simple competition, since, unless a sort of delivery service more or less synonymous to the ordinary package delivery service, i. e., a firm in the business of delivery of packages purchased from any and all sellers to any and all buyers, is maintained by the milk distributing company, the mere fact that enough steady customers are secured to require the services of specialized milk delivery men is almost *prima-facie* evidence of product differentiation. Thus a distributor has his customers who purchase from him month after month, and it is highly improbable under these conditions that buyers and sellers are associated in random fashion, as they would tend to be under conditions of simple competition.

The degree to which all of the factors treated in the foregoing affect the price structure for milk depends to a large extent upon the success of the product differentiation that is attempted, that is, whether the product is so successfully differentiated that the number and volume of substitute products are appreciably diminished, or is largely unsuccessful so that consumers have little or no preference for the product in question as compared with the general class of products in the market. With this discussion as a background, the nature of the equilibrium adjustments of large-scale firms operating under conditions of complex competition (complex marketing or markets) will be considered.

2. The nature of the equilibrium adjustment under conditions of complex competition.—The preceding section has set forth certain facts and information with respect to conditions in the milk industry insofar as they relate to the question of whether the milk-price struc-

⁹⁰ Chamberlin, Edward, *Theory of Monopolistic Competition*, p. 123.

⁹¹ *Ibid.*, p. 125.

ture is or may be determined under conditions of simple or complex competition.

As far as the size of business of the individual distributor in relation to the total volume of business in the market is concerned, it appears that one of the major conditions necessary for the milk-price structure to be determined under conditions of complex competition is widely prevalent in milk markets, i. e., that the volume of business of individual distributors be a significant portion of the total volume of business in the market. Whether the price will be higher or lower than it would be under conditions of simple competition depends upon (a) the seller's computations in regard to the effect of his actions upon the price,⁹² and (b) whether economies of large-scale organization and operation are such as to reduce the price below what it would be under conditions of simple competition.

As to whether the price is higher under conditions of simple or complex competition, it will be necessary to ascertain whether the economies of large-scale organization and operation in milk distribution are large enough to offset, or more than offset, the impetus to higher-than-competitive prices that in itself is a function of the conditions of complex competition. Stated differently, the question resolves itself into a consideration of whether the supply price, i. e., the price necessary to call forth a given volume of milk, and the requisite distributor services, is higher or lower under conditions of complex or simple competition; and if it is lower under conditions of complex competition, whether the difference in supply price is more than offset by the impetus to higher prices engendered by the large size of the distributor's business and differentiation of his product. This is a very complex question and no attempt to resolve it conclusively is made in this publication, since a great deal of involved research work must be done before the problem can be solved conclusively.

On the whole, it appears that two major conditions that would obtain if the milk-price structure were determined under conditions of simple competition, small size of distributors, and a homogeneous product are largely lacking in milk markets. Instead, conditions of (1) large size of business of individual distributors in relation to the volume of business in the market as a whole and (2) differentiation of the product, exist to an appreciable degree. This being the situation, it follows that the problem of the milk-price structure is not well adapted to analysis by simple-competitive economic theory. Rather, it appears that the problem can be approached with better chances

⁹² Chamherlin has this to say in regard to the general problem set forth in (a) above:

"If sellers have regard to their total influence upon price, the price will be the monopoly one. Independence of the producers and the pursuit of their self-interest are not sufficient to lower it. Only if the number is large enough to render negligible the effect of an adjustment by any one upon each of the others is the equilibrium price the purely competitive one. If the market is imperfect, however, true self-interest requires the neglect of indirect influence to a degree depending upon the degree of imperfection.

"If sellers neglect their indirect influence upon price, each determining upon his policy as though his competitors were uninfluenced by what he did, the results vary, depending upon further circumstances. If each assumes his competitors' supplies to be unchanged, the equilibrium price is continually lower than the monopoly one as the sellers are more numerous, descending to the purely competitive level only when their numbers are infinite. If each assumes his competitors' prices unchanged, and if competitive bidding, or 'recontract', continues until no further price change can be made without disadvantage to someone, the equilibrium price is the purely competitive one for only two sellers, and, of course, for any greater number. If the full power of the seller to alter his price, even to the disadvantage of the buyer, is recognized, however, price will oscillate over an area which becomes narrower and approaches more closely the purely competitive figure as the number of sellers becomes larger.

"If sellers neglect both their indirect and direct influence upon price, the outcome will be the purely competitive price, regardless of numbers.

"Uncertainty, where present, as to (a) whether other competitors will hold their amounts or their prices constant, (b) whether they are farsighted, (c) the extent of the possible incursions upon their markets, and (d), in the case of a time lag, its length renders the outcome indeterminate for the particular reasons indicated in each case." Chamherlin, Edward, *The Theory of Monopolistic Competition*, ch. III, p. 54.

of securing valid results by considering it in terms of the theory of complex competition.

Attention is now devoted to setting forth the nature of the equilibrium adjustment of an individual seller under conditions of complex competition.

Let the cost curve ac in figure 24 represent the average cost curve of the seller under conditions of complex competition.

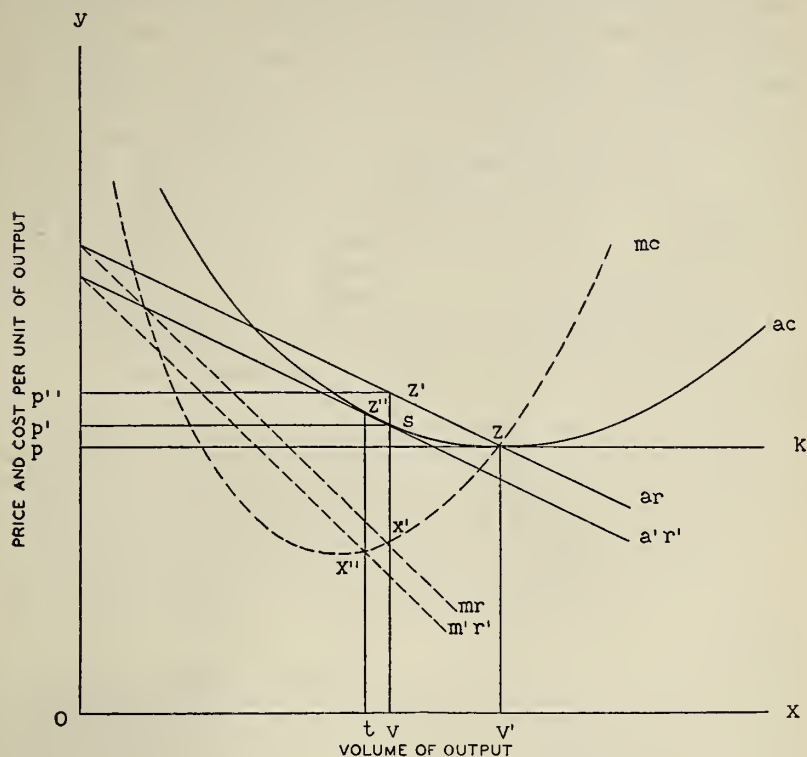


FIGURE 24.—The nature of the equilibrium adjustment under conditions of complex competition.

Under conditions of simple competition, equilibrium is achieved when the average cost curve, ac is tangent to the ruling market price, pk in this instance, and the volume ov' is being produced by the seller in question. Of course, there is probably a wide range in the volume of output of individual sellers so that ov' is variable between sellers; but if rents are included as costs, the cost curves of each of the sellers are the same distance from the x axis, op in the illustration, and tangent to the line pk .

Consider now the seller under conditions of complex competition. It is assumed that product differentiation is at the optimum point and that no changes in selling expenditures, which are included in the curve ac , will be made as the adjustment to equilibrium, which is now to be described, takes place. This is admittedly an arbitrary assumption since, if changes in selling expenditures were made, the cost curve as well as the demand curve probably would be altered. However, these complications are ignored for the purposes of exposition.

Assume for the moment that the price is set at vz' . The marginal revenue curve, mr , and the marginal cost curve, mc , intersect at x' , and the volume ov is produced. This is a position of stable equilibrium as far as the individual firm is concerned, since marginal revenue equals marginal cost and profits are at a maximum. However, this is not a position of stable equilibrium as far as the group is concerned. The curve ac includes normal profit, hence the profits represented by the rectangle $p'sz'p''$ are excess profits. If firms are free to enter the field they will do so, forcing the seller under consideration to share his market with them. The average revenue curve will move down and to the left, and the movement will cease when the area of excess profit is eliminated, which will be the case when ar has moved to the left to a position of tangency with ac at z'' , the new average revenue curve being $a'r'$. The output is now ot , and at the price tz'' the enterprise is in a position of stable equilibrium, since profits have been reduced to the competitive level and firms will neither enter nor leave the field. This adjustment takes place only if firms have free entry into the field. If such entry is limited the excess profits, $p'sz'p''$, are beyond the reach of competition. Insofar as such profits are protected by brands, trade-marks, and patents, the adjustment to tz'' does not necessarily take place, depending upon the degree to which competitors are able to develop substitutes and thereby reduce the market for the seller in question.

The nature of the demand for milk was set forth in chapter 3. It is, of course, evident that under conditions of complex competition an inelastic demand for this product is to the advantage of the seller. However, the demand for the general type of goods in the market may be decidedly inelastic, yet unless the business of the individual seller is large—in relation to the volume of business in the market—or his product is highly differentiated, or both, the demand curve for his product is a horizontal line, i. e., of infinite elasticity, at the ruling market price.

The theoretical treatment of the problem up to this point has been in terms of a seller selling one commodity, and the generalizations relating thereto therefore are more or less restricted to industries producing one commodity, or a major commodity and unimportant byproducts. Attention is now turned to a consideration of the nature of the equilibrium adjustment in industries where several products are produced from one raw material, that is, in situations more comparable to the milk industry.

The analysis thus far has shown that the business of certain individual distributors in many milk markets is large in relation to the volume of business in the market. The distributor stands in the position of the so-called middleman; i. e., he takes a raw material from producers and gives it desired place, form, and time utility. The milk distributor, however, is in a far different position than the merchandiser who handles one product, or several, and the byproducts therefrom. A flour miller, for example, receives wheat, manufactures it into flour, and the middlings and bran are byproducts of the flour manufacture. The more flour he manufactures the more bran and middlings he has for sale. The size of the output of bran and middlings is a function of the volume of wheat processed into flour. However, the milk distributor receives a supply of raw material, milk, which can be sold in a number of different forms. He may manufacture it

into such dairy products as butter, cream, ice cream, evaporated milk, sell it as fluid milk, etc. Unlike the flour miller's sales of bran and middlings, which are a more or less mechanistic function of the total output of his major enterprise, flour milling, the milk distributor's relative sales of milk, cream, butter, etc., from a given supply of raw material, bulk milk, are dependent entirely upon his judgment as to the proportion of the total supply which should be sold in each product form in order to maximize his profits. He may allocate a larger portion to milk, or butter, as the case may be, in order to increase his profits (or minimize his losses). If the demand for fluid milk is sufficient to take practically all of his milk in the form of fluid milk at prices considered sufficiently remunerative, he may sell practically all of his supply as fluid milk. On the other hand, if he has such a large supply of milk that he cannot find purchasers for it at the price he desires, he may divert these excess supplies to product enterprises, manufacturing them into butter or other manufactured dairy products. He may increase the price at which he sells fluid milk, diverting to product use the volume represented by the loss of sales engendered by the increase in price. Thus it should be clear that the distributor is in a position to practice interenterprise diversion, i. e., divert varying proportions of the milk he receives from one enterprise to another in order to maximize his profits (or minimize his losses). Whether he does this to any appreciable degree, and thereby causes the milk-price structure to be different than it would be otherwise, depends in large part upon the competition of other distributors. Hence the remarks just made refer to distributors in general and their position in regard to the matter of interenterprise diversion. The degree to which distributors in any particular market practice interenterprise diversion depends upon numerous factors which will be treated later.

The question now arises as to the conditions that would make it profitable for the distributor operating under conditions of complex competition to follow this practice. Perhaps the problem can best be approached by considering the analogous case of a producer⁹³ operating in one market, in which his volume of output is relatively large, and having readily available to him another market wherein he can dispose of his product, but in which his entire output is relatively small and has no appreciable effect on the market price. In the first market, designated market A, the demand curve for his product is negatively inclined, while in the second market, designated market B, the demand curve for his product is a horizontal line at the ruling market price. Consider first the manner in which the producer will distribute his output between the two markets. Let mr represent the marginal revenue curve of the producer in market A, and pk the marginal revenue curve of the same producer in his alternative market, market B. In market B, of course, the marginal revenue curve and the average revenue curve are the same. If the producer were selling only in market A, he would produce ov'' , the volume associated with the point of intersection of mr and mc , since at this point his profits are maximized. (See fig. 25.) If the ruling market price in market B is $v''t$, the producer will sell all of the output ov'' in market A. He will sell no more than this in market A, because each additional unit above the volume ov'' will sell for less than it costs, and for the same

⁹³ The terms "producer", "distributor", and "seller" are used synonymously throughout this section.

reason he will sell none in market B, since the price $v''t$, and hence pk (the marginal and average revenue curve in market B) lie below mc at all ranges of output on either side of v'' . If the ruling market price in market B is oz , all of the producer's output, ov'' , will be sold in market A. If the ruling market price in market B is op' and $p'k'$ crosses the marginal revenue curve for market A at t' , the producer can increase his income by diverting product from market A to market B beyond the point t' , and will sell the volume $v'f$ in market B. The producer would produce the volume of , and the volume sold in market

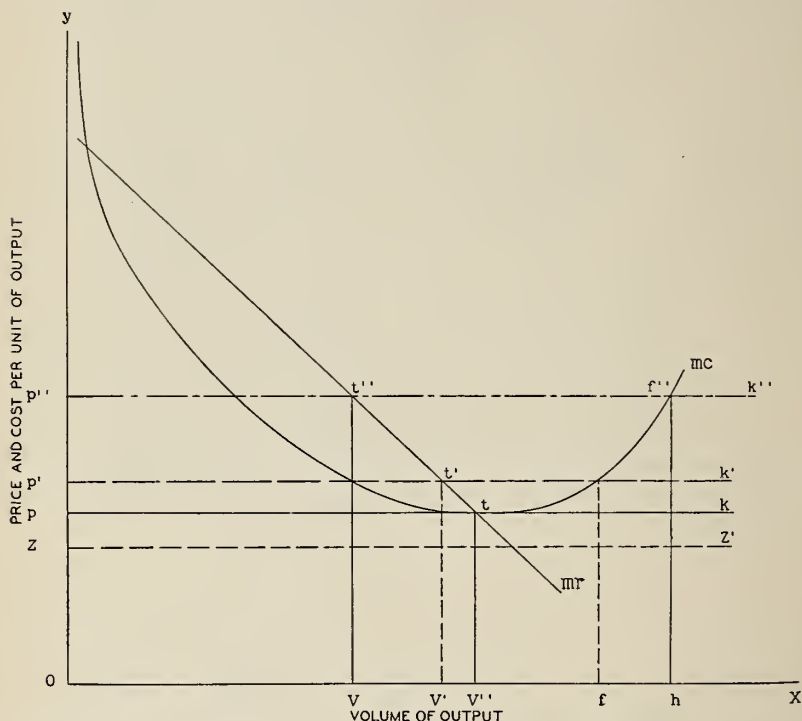


FIGURE 25.—Prices and output of the individual producer operating in two markets, in one of which he is operating under conditions of complex competition and in the other under conditions of simple competition.

A would be $v'v''$ less than when the ruling market price in market B is op . Similarly, if the ruling market price in market B is op'' and $p''k''$ crosses the marginal revenue curve for market A at t'' , the producer will divert product from market A at t'' , selling the amount ov in market A, and the amount vh in market B.

The example just given does not set forth a position of equilibrium for market A, nor does it show the relationship between prices in market A and market B. All it shows is that under certain conditions the producer will shift product between markets A and B in order to maximize his profits (or minimize his losses), the degree of the diversion to market B depending upon the point at which the ruling market price in market B intersects the marginal revenue curve, mr , in market

A. The marginal revenue curve in market B must intersect the marginal revenue curve in market A at some point above the intersection of the marginal revenue curve in market A and mc , the marginal cost curve, else no product will be diverted from market A to market B.

The adjustment of prices and output toward a position of equilibrium in markets A and B is shown in figures 26 and 27. The curve ac (fig. 26) represents the curve of average costs, including normal profits. The curves ar and mr are the average and marginal revenue curves in market A, and the line pk represents the average and marginal revenue curves for market B. If the producer did not have market B available he would produce ov' and sell it at the price $v'e$, at which point surplus profits of $ngem$ would be secured. If, however, market B is available it will be profitable to divert product to market B at q where the marginal revenue from a unit of product in market B exceeds the marginal revenue from the sale of a unit of product in market A. The most profitable volume of output will be os , with ov sold in market A and vs sold in market B. This arrangement of output will secure an excess profit of $pqn p'$, which is larger than that secured by operating in market A alone, since not only does the diversion of product vv' increase revenue because the marginal revenues of that product are higher in market B but, also, average costs are lowered on all the product by extension of production from ov' to os . The line uqk may be considered the marginal revenue curve for most profitable utilization considering both markets, and the proper volume of output is os where the marginal revenue and marginal cost curves intersect, as in the case of a single market.

If entry of firms into the field is not restricted, or fairly acceptable substitutes can be developed, or both, the excess profits will attract competitors to the field. This will result in shifting the average and marginal revenue curves in market A. Assume that enough have entered the field to shift the average revenue curve to a point of tangency with the average cost curve, as shown in figure 27, at h . If there were no alternative market available for the diversion of product, this would be a position of stable equilibrium since at this point there would be no excess profits to attract more competitors to the field, and os' would be produced and sold at a price of $s'h$. If, however, the alternative market B is available for diversion, it will be profitable to divert $v's'$ to market B and expand production from os' to os , selling the added product in market B. This arrangement would result in a profit represented by $pq'n'p''$. This profit may be sufficient to attract new competitors to the field. Depending upon the strength of the monopoly elements in market A, the price in market A will be indeterminate between op' , the price at which excess profits are greatest with diversion, and op , the price of the product when sold in market B.

If the price in market B, the market to which product may be diverted, is below the average cost of the seller at the output associated with the low point on the average cost curve, it may still be profitable to divert if all sellers operate under the same conditions, that is, all share in the diversion. The lines ac and mc are the respective average and marginal cost curves, ar and mr the average and marginal revenue curves in market A, and pk the average and marginal revenue

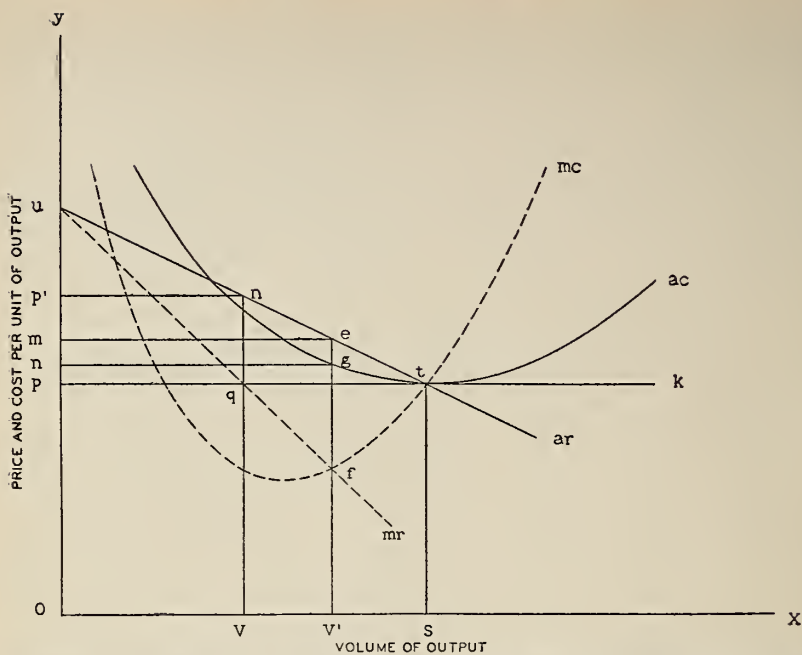


FIGURE 26.—Adjustment of production by a single seller in a market when an alternative market in which he is a small part is available for diversion of product.

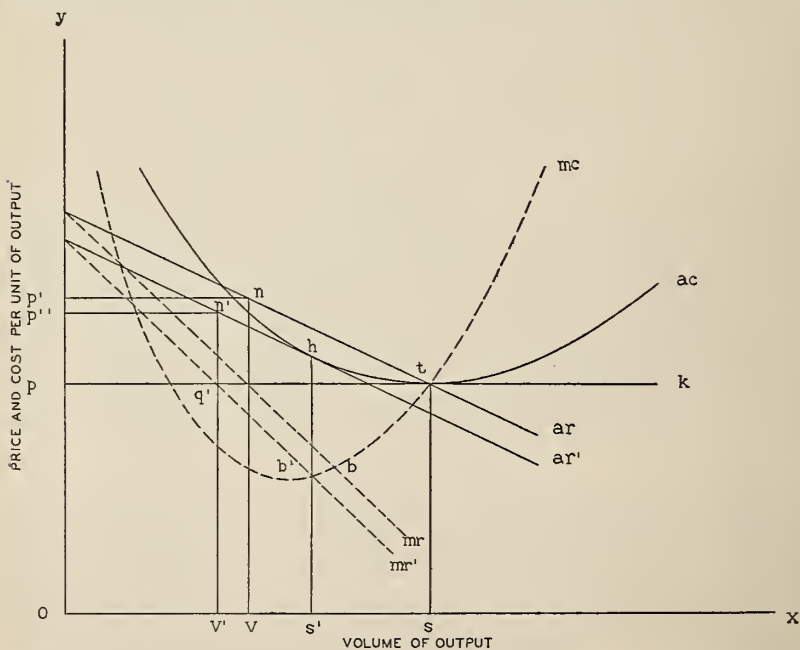


FIGURE 27.—Effect of an increase in number of sellers in a market previously restricted to a single seller, where there is also an alternative for diversion to a market of which each seller is a small part.

curves for market B. (See fig. 28.) Under these circumstances the quantity os is produced, ov is sold in A at a price of vn , and vs is sold in B at the price sd . The excess profit from sales in market A are represented by the rectangle $mp'ng$ and the losses in market B by the rectangle $gqtd$. In the circumstances illustrated a seller who was not forced to divert would make an excess profit and, with the same average revenue curve in market A, could sell some quantity larger than ov and up to ov' for this market and make a considerable excess profit. This would attract sellers until the complex competitive equilibrium was reached for market A only, such as to lower the price below that profitable for those diverting. In consequence, it appears that the market price under these conditions of diversion may lie between a price appropriate to complex competition in the market

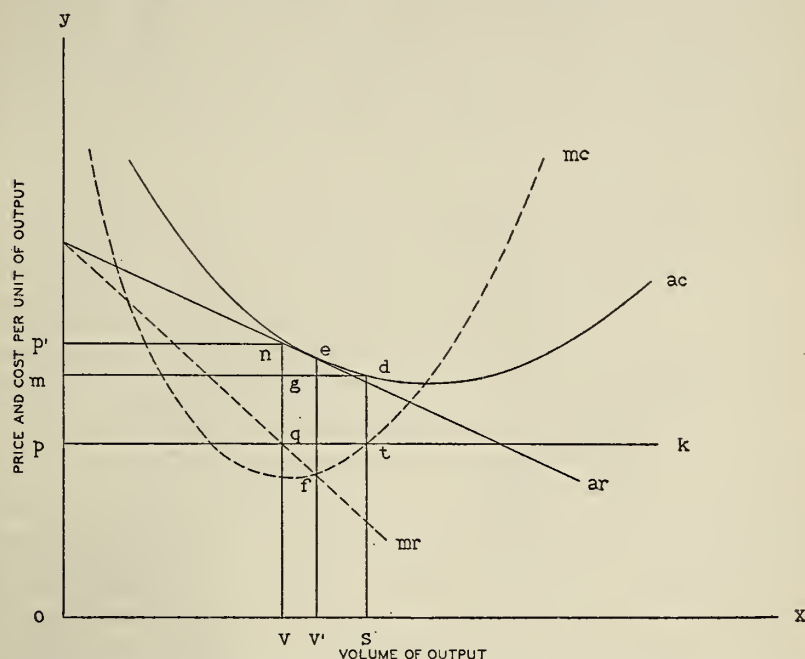


FIGURE 28.—Adjustment of production by producers in a market with few sellers and an alternative market with many sellers when the revenue curve in the alternative market is below the lowest average costs of operation.

without diversion and a higher price with diversion. The price realized depends upon whether all the sellers are similarly situated so that they all are in a position to practice diversion or some are so situated that they may realize the benefits of the restricted market without suffering the losses of diversion, and the strength of the monopoly elements in the market.

The foregoing short discussion indicates the complexities introduced into the price problem when the seller has a particular market in which his volume of output is large, and another market available to him in which he is in the position of a simple competitor, i. e., his total possible output in the latter market being so small that it has no practical effect on the market price. The manner in which the

considerations just advanced affect the price structure for milk will be treated below.

3. The allocation of milk among enterprises.—The problem now to be considered is that of the individual producer who, from a given raw material, can process and sell several products such as fluid milk, fluid cream, butter, and other dairy products, the demand for the products other than fluid milk being more elastic than the demand for fluid milk or with respect to which the producer operates under conditions of simple competition. The general principle is that producers (sellers-distributors) will employ their resources in the several enterprises, if more than one enterprise is undertaken, so that the individuals' marginal returns from a unit of resources are equal in all enterprises. Furthermore, in a position of stable equilibrium productive resources will be pushed to the margin in each enterprise, i. e., to the point where any additional application of the factors of production would result in an increase in sales value less than the cost of application of the productive resources. From this it follows that distributors will utilize the milk they receive, and the other productive resources available to them, in such fashion that marginal returns are equal in all uses or enterprises. Such would be the case under conditions of simple competition, and distributors would shift their channels of disposal as changes in ruling market prices, upon which their volume under such conditions would have very little or no effect, made first one outlet, then another, more profitable. Such shifts would cease when the prices of all dairy products were in a position of general equilibrium with respect to each other and competing commodities.

In figures 27 and 28 it was shown that the producer selling a product in two markets, in one of which he is operating under conditions of complex competition and in the other under conditions of simple competition, would divert the product from the former to the latter at the point of intersection of the marginal revenue curves for the two markets, provided the point of such intersection were above the point of intersection of the marginal cost and marginal revenue curve in the market in which the producer is operating under conditions of complex competition. In those examples the question of different cost curves for different enterprises did not arise, since the producer was assumed to be producing only one commodity. In the case where the producer may divert milk from one product to another, account must be taken of differences in costs of producing the different products. On the whole, it would appear that when two or more products are produced from a given raw material, such as milk, profits will be maximized when marginal revenue less marginal cost in one enterprise is equal to marginal revenue less marginal cost in the other enterprise. Thus let mc and mr equal marginal cost and marginal revenue, respectively, in enterprise A, while $m'c'$ and $m'r'$ equal marginal cost and marginal revenue, respectively, in enterprise B. If $mr - mc = m'r' - m'c'$, the enterprises are in balance and no change in the proportions of raw material entering the one or the other is indicated. If, however, $mr - mc$ is less than $m'r' - m'c'$, it will be to the advantage of the distributor to divert milk from the fluid milk (A) to the butter (B) enterprise, or vice versa if $mr - mc$ is greater than $m'r' - m'c'$.

Thus far it has been found that (1) there is strong reason to believe that the milk price structure is determined under conditions of complex competition, and (2) such being the case, distributors are in a position

to practice interenterprise diversion (the shifting of greater or lesser amounts of milk from one enterprise to another), depending upon the strength of the elements that are attributes of complex competition. Distributors sell their milk in the local market, where there are strong reasons for believing that some of them, especially the large ones, may materially affect prices by their operations. Excess milk is often sold in the form of products for which the market is national in character, such as butter, cheese, and evaporated and condensed milk. Thus the output and sales policies of distributors regarding products processed from excess milk can have little influence upon the price of these products, on account of the insignificant volume of their sales relative to production and sales of these products in the United States. The position of the milk distributor in regard to the allocation of milk among enterprises is therefore analogous to the position of the seller who has available to him a protected market where he is an important factor in the trade, and a market where he is in the position of a simple competitor. From the statements above it follows that under conditions of complex competition interenterprise diversion is likely to be found to be a factor of considerable importance in the milk-price structure.

With the theoretical and factual information concerning the nature of the competitive forces operating in milk markets as a background, attention is now turned to a consideration of the milk-price structure under assumptions of simple competition with respect to milk production, and conditions of complex competition found to exist in milk markets with respect to milk distribution.

4. The operating reserve.—When considered in the light of the usual supply and demand analysis of the factors affecting the price of any particular commodity, it might be expected that retail milk prices to consumers would be adjusted or changed from day to day and week to week as changes took place in the supply and demand situation. Stated differently, if on a particular day of the week, or during any particular week, milk supplies increased or decreased, it might be expected that retail milk prices (assuming no change in demand) would vary inversely to the changes in supplies, especially in view of the fact that milk is a highly perishable product and cannot be stored advantageously.

As far as actual supply and demand conditions are concerned, there are relatively large day-to-day variations in demand and relatively small day-to-day variations in supply. Under these circumstances it might appear that there would be marked variation in the retail price of milk from day to day. However, it is probable that this pricing procedure would necessitate a type of market organization or mechanism whereby buyers and sellers would meet, or through which buyers' day-to-day demand schedules and sellers' day-to-day schedules of reservation prices would be made known and would operate to adjust prices in accordance with the day-to-day supply and demand situation. This type of market organization or mechanism would be somewhat analogous to the present produce exchanges. However, such procedure would be markedly different from the present procedure through which day-to-day retail prices not only of milk but of many other products are established.

As a matter of fact it appears that there is no single market for fluid milk in an urban center that approaches the character of an

auction market where buyers and sellers meet and through the mechanism of bids and offers make known their day-to-day demand schedules and day-to-day schedules of reservation prices. From some points of view, a city can scarcely be considered a milk market, except in the sense that it is the geographical location of a place where milk is bought and sold. It is, true, a place where price-making forces operate, but a clear understanding of the price of milk in any particular city cannot be gained from a study of simple competitive supply and demand forces with respect to the city considered as a market. Rather, it appears necessary to break down the analysis into its component parts and analyze the many markets making up the large market. This situation arises because, within the market place comprising the geographical limits of the city, there exist numerous smaller markets: The markets for the product of the individual distributor who is associated with his customers, not on the basis of a random association, as would be the case from day to day in a market under conditions of simple competition, but on the basis of preference for the differentiated product of the individual distributor. Each distributor has his customers to whom he delivers milk and does not meet with buyers, as distinguished from customers, from day to day for the purpose of arriving at a price for milk.

Milk is generally distributed to consumers early in the morning, and numerous milk routes are necessary in order that customers be reached. A driver on a milk wagon cannot ascertain the demand for milk on his route until he has completed deliveries. Thus, as a practical matter, it is impossible for him to adjust his prices in accordance with the demand situation as he finds it. The same considerations apply to the distributive enterprise as a whole. If the demand schedules of consumers on each milk route, and the aggregate demand schedules of consumers purchasing from each distributor and for the market as a whole, were known and accurately predictable from day to day, then the dealer could presumably quote prices each day on the basis of day-to-day changes in the day-to-day supply and demand situation. As a practical matter this procedure would be extremely unworkable. The highly technical nature of the analysis that would be necessary if such procedure were to be followed, the cost of such precise analysis (which would probably have to be detailed enough to allow the determination and forecasting of the demand schedules on many, if not all, milk routes), and the partially indeterminate nature of the results secured would preclude following the procedure outlined. The only practical procedure is for the distributor to quote prices for a longer period of time, rather than to quote prices daily. This is the procedure distributors actually follow, and under these circumstances day-to-day variations in the demand for fluid milk (day-to-day variations in supplies⁹⁴ are negligible) are manifest in variations in day-to-day purchases by consumers at a constant price, rather than being manifest in day-to-day variations in price. Thus a distributor must always have on hand a volume of milk sufficient to meet the maximum demand he may expect from day to day. On the days when the demand is heavy the distributor may sell practically all of the milk he receives as fluid milk, although it is probable that he will have some milk in addition to that necessary to meet the maximum

⁹⁴ This is not to say that supplies do not change from day to day, since there is a trend in daily supplies that is seasonal in character. However, this trend is small when considered on a daily basis.

demand. Since production does not vary much from day to day and there is certainly no reason to believe it varies precisely as demand varies from day to day, the distributor will not sell all of the milk he receives each day as fluid milk but will sell what he can at the established price, diverting the remainder to use in other dairy products. It is probable that little would be gained by compiling data in an effort to test the conclusion just stated. Every consumer of fluid milk knows that the price does not change from day to day. The tables given in the previous chapter show the daily variation in the demand for milk at constant prices. The fact of the "operating reserve", which is the term applied to the volume of milk in excess of average daily sales needed to meet daily variation in demand, is so well known to those acquainted with milk marketing that it needs no further consideration. Suffice it to say that the reasons for the operating reserve are to be found in the conditions of complex competition under which milk markets operate. If the markets were operating under conditions of simple competition, market prices would change from day to day as supply and demand conditions change. However, with the conditions of complex competition that actually prevail in milk markets, changes in demand are associated with larger or smaller takings of milk from one day to another at a constant price. The distributor, in order to have available a supply sufficient to meet the maximum sales he may have on any one day, has milk in excess of fluid sales on the days when sales are less than the maximum. This daily excess is hereinafter called the operating reserve.

5. **The seasonal excess.**—The seasonal character of prices in a fluid milkshed under assumptions of simple competition, as regards both production and distribution, was developed in section I of this chapter. The conclusions reached were that retail and farm prices of fluid milk within the milkshed would vary inversely to the seasonal variation in production and that the seasonal variation of fluid-milk consumption in the market would be about the same as the seasonal variation in milk production within the milk supply area. Thus, in a position of stable equilibrium with respect to average annual prices, production, and consumption, there would be a seasonal variation in prices inverse to the seasonal variation in production and consumption, and the seasonal variation in the latter two would be about the same.

Consider the case as it actually exists in milk markets. In the first place, many of the distributors have a volume of business that is significant in relation to the total volume of business in the market. In the second place, the product of individual distributors is differentiated to a greater or lesser degree from the product of other distributors. Also, there is the problem of spatial differentiation. A distributor, especially if small, will tend to confine his operations to a small area within the city and hence may not wish to extend his operations to such an extent that all possible customers may become acquainted with his product and sales and price policies, and compare them with distributors operating in their neighborhood.

If the distributor reduces his price in order to get consumers for the increase in milk receipts which is a function of the seasonal increase in production, it is highly probable that other distributors would meet his price in order to avoid losing customers. As was pointed out before, the demand for fluid milk is inelastic, at least with respect to

1-cent changes in the price of milk per quart. If all distributors cut their prices, more milk would be sold but it appears reasonable to believe that it would take marked changes in the retail price to move the seasonal increase in production into consumption as fluid milk. Certainly for 1- or even 2-cent changes in the retail price it is improbable that the increase or decrease in sales would be proportional to the increase or decrease in price. The result of the general downward movement in prices would be that in all probability the dealers would find themselves with a considerable volume of excess milk on their hands even after having reduced prices considerably. The dealer, in determining upon his sales and price policies, and knowing—or at least having a good idea—of the manner in which his competitors will react to his sales and price policies, will hold his prices constant on a seasonal basis, diverting the seasonal increase in production to uses other than fluid milk. The distributor, in thus practicing interenterprise diversion on a seasonal basis is merely pursuing his best interest and conducting his business in such a manner as to maximize his profits, or minimize his losses, in view of the circumstances affecting his market.

So much for the theoretical treatment of the nature of the operating reserve and seasonal excess, with respect to which data and information relating to certain markets were given in chapter 3.

6. The effect of organization of the supply upon seasonal interenterprise diversion.—The question may now arise as to whether the practice of interenterprise diversion on a seasonal basis is a practice that is followed by distributors in seeking the most profitable seasonal allocation of the supply of raw material they receive, or is forced on the distributors willy-nilly by producers having an appreciable degree of control over the market supply. Thus it might be argued that, in all the cases relating to the daily and seasonal excess cited in chapter 3, producers have control of a large portion of the total market supply, sell their milk to distributors on the basis of a classified price plan, maintain seasonally constant prices to distributors for all milk sold by the distributors as fluid milk, and thereby exert a marked tendency to cause distributors to hold their retail prices constant on a seasonal basis. Indeed, this argument has a degree of *prima-facie* authenticity. However, it should be remembered that the cooperative movement in fluid-milk marketing has developed to an appreciable extent only since about 1918.⁹⁵ Data on milk receipts and fluid-milk sales of distributors prior to 1918 are not at hand. Thus it is impossible from the available data to demonstrate interenterprise diversion on a seasonal basis by analysis of production and sales figures in various markets prior to 1918. However, retail prices for many markets are available prior to 1918, and in accordance with the theoretical treatment of the seasonal variation of prices that would obtain under conditions of simple competition developed in section I of this chapter, analysis of the retail-price series available should indicate whether there was any seasonal variation in such prices prior to 1918. If there were seasonal variation in such prices, it follows that milk prices were not determined largely under conditions of complex competition. Conversely, if there were no seasonal variation in retail prices, it follows that milk prices were determined largely under conditions of complex competition. If the latter were the case, it follows that

⁹⁵ Metzger, Hutzler, *Cooperative Marketing of Fluid Milk*, Technical Bulletin No. 179, Bureau of Agricultural Economics, p. 3.

distributors either practiced interenterprise diversion prior to 1918 and prior to the advent of the cooperatives as an important factor in determination of milk prices, or contracted and expanded the size of the area from which they procured their supply inversely to the seasonal variation in production in the area. A study of figure 29 and of the data set forth in table 31, and in tables 59 and 78-89, inclusive, appendix A, shows conclusively that there was practically no seasonal variation in prices in the 14 markets for which data are presented. Also, it is significant to note the differences in the seasonal course of the retail price of fluid milk as compared to that of other farm products, such as meat, eggs, butter, and similar products. (See fig. 30, also table 90, appendix A.) The seasonality in retail prices of fluid milk as compared to the seasonal variation in the retail prices of the other products is quite small. It would serve no purpose to pyramid data and information with respect to this point. Further verification of the point under discussion may be secured by reference to the reports pertaining to retail prices in selected cities, issued by the Bureau of Labor Statistics, United States Department of Labor. The data given are sufficient for general empirical validation of the conclusions reached in the preceding parts of this section. Retail prices remained practically constant on a seasonal basis, the seasonal increase in production being diverted to use in dairy products other than fluid milk. This seasonal interenterprise diversion was either accomplished directly by distributors diverting the seasonal excess of production over fluid-milk sales to other dairy-product enterprises controlled by them, or indirectly by refusing to take the milk of certain producers during the flush production period, thereby keeping their milk receipts equal to fluid-milk requirements and forcing the other producers to seek other product outlets for their milk. Hence, although it may be that interenterprise diversion on a seasonal basis is made more positive by the advent of cooperative bargaining associations of producers, this practice existed long before producer cooperatives became an important factor in the price situation.

TABLE 31.—*Number of periods during which retail prices of milk remained unchanged for a year or more in principal milk markets*

Market	Period during which price remained unchanged						Period during which price remained constant for a year or more expressed as percent of total months in entire period
	12 months	13-24 months	25-36 months	37-48 months	Over 48 months	Period years covered	
New York.....	-----	1	2	-----	1	1909-31	46.7
Boston.....	1	-----	1	-----	-----	1907-31	15.3
Philadelphia.....	-----	1	2	-----	1	1907-31	67.7
Chicago.....	-----	1	-----	1	2	1907-31	71.7
Baltimore.....	2	5	1	-----	1	1909-33	69.7
Washington.....	-----	4	1	-----	-----	1909-31	31.2
Minneapolis.....	1	4	1	-----	-----	1909-30	40.2
St. Paul.....	1	2	1	-----	-----	1914-31	33.8
St. Louis.....	-----	1	1	-----	1	1909-31	52.2
Atlanta.....	1	5	-----	1	-----	1907-31	44.0
Omaha.....	1	3	-----	-----	-----	1909-31	26.4
Denver.....	2	3	-----	1	1	1909-31	60.1
Los Angeles.....	-----	5	-----	1	1	1909-31	64.9

Based on data secured from reports of the Bureau of Labor Statistics.

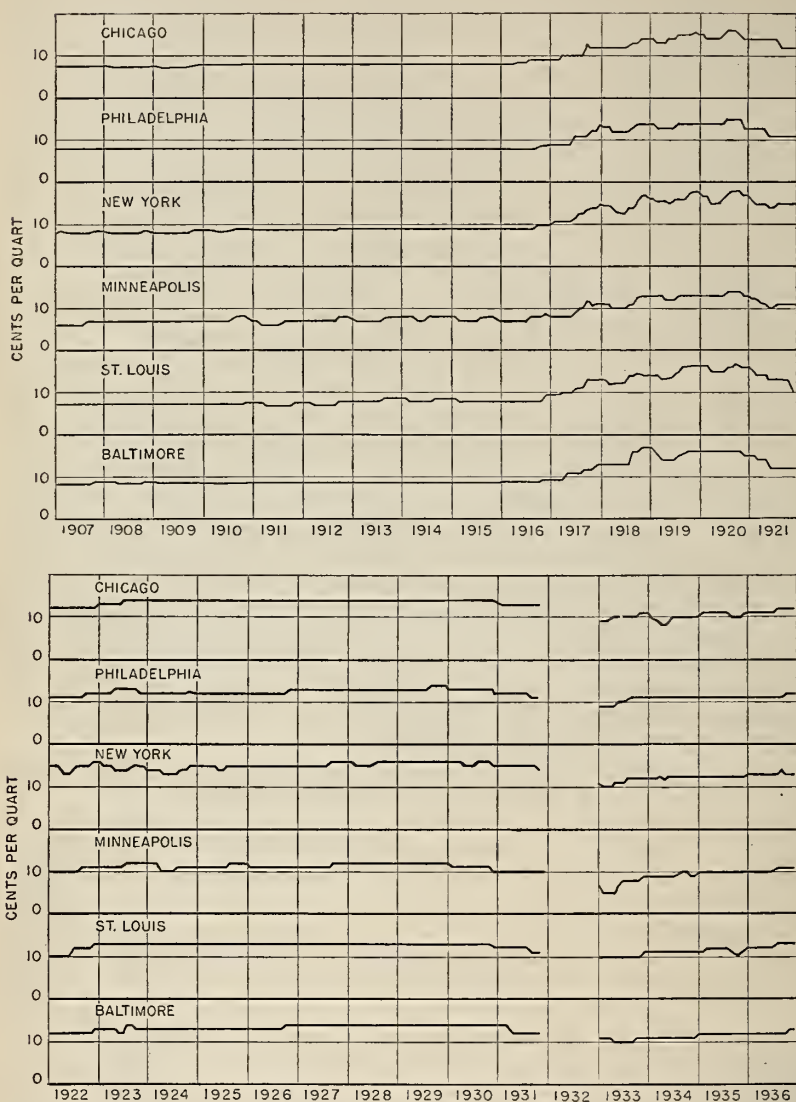


FIGURE 29.—Retail price per quart of milk delivered to family trade in specified cities, 1907-36.

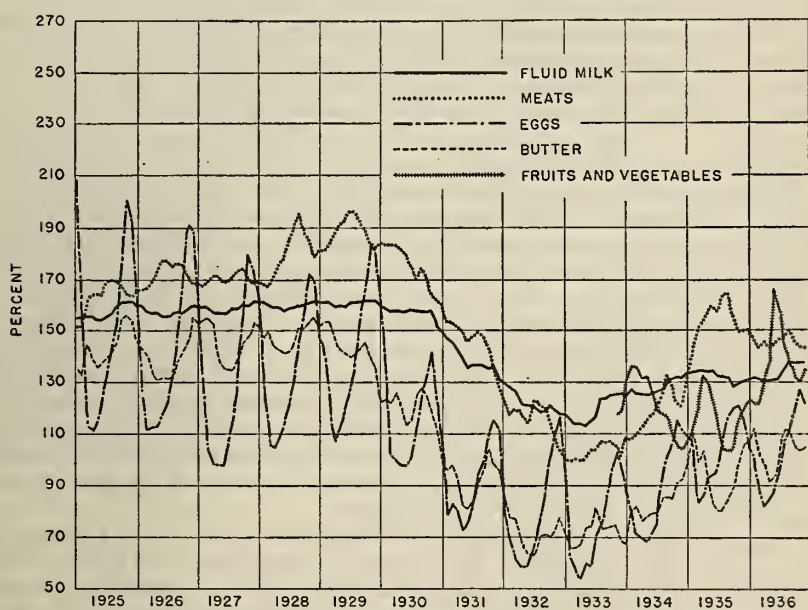
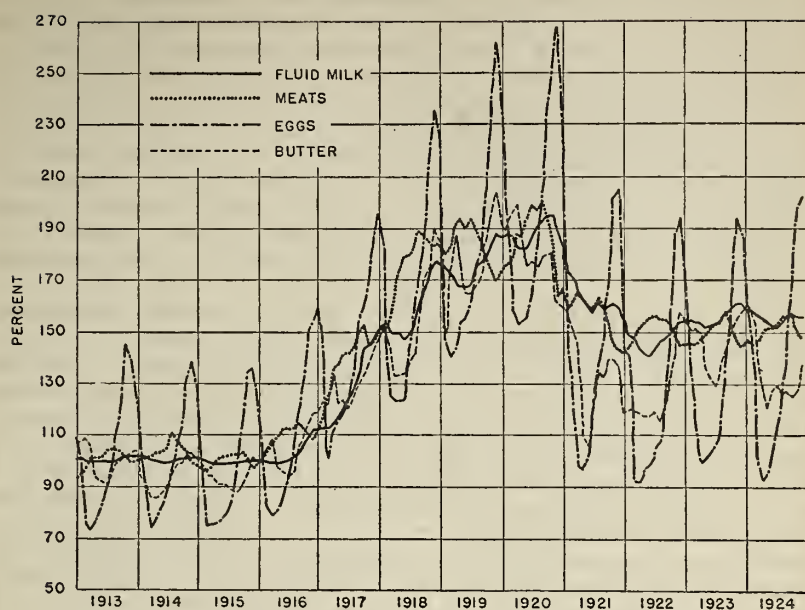


FIGURE 30.—Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36 (1913=100).

7. **Annual interenterprise diversion.**—Interenterprise diversion on an annual basis, if it may be presumed to exist, raises many perplexing questions, chiefly concerning its measurement. Following the general theory set forth in the preceding parts of this section, distributors would divert a greater or lesser proportion of their annual supplies to uses other than dairy products insofar as such diversion resulted in a gain in sales revenue greater than the cost of diversion. However, if there is competition among distributors it is probable that distributors would not divert more than the daily excess or operating reserve to uses other than fluid milk during the season when supplies most closely approximated market requirements. If competition were restricted, annual interenterprise diversion would probably be practiced, the extent of such practice depending upon the strength of the monopoly elements.

8. **The price structure for milk—the effect of seasonal variation in production—uniform quality requirements.**—The data and information presented in the preceding sections of this chapter indicate the reasons for the development of the operating reserve and the seasonal excess. In this section the effect of the seasonal excess upon the price structure for milk in a milkshed will be developed, with the assumptions as regards milk distribution fitting what appear to be the facts in the case as developed previously, namely, that the milk distribution enterprise is carried on under conditions of complex competition. For purposes of presentation, the exposition is presented in terms of the seasonal excess rather than the daily or annual excess, first, because in all probability this type of excess is most important from the standpoint of its effect on the price structure, and second, because it is probably the one with which elements in the market are most familiar.

First, reference is made to section I of this chapter, where the effect of transportation and quality requirements was studied under the assumption that there was no variation in production and consumption. It was found that, with no differences in the sanitation regulations and with all milk brought to the city for processing, all milk would sell for one price, regardless of the form in which it was sold to consumers. With decentralized processing, only milk sold as fluid milk to consumers would be brought to the market as milk, the other dairy products coming to the market as cream, evaporated milk, butter, and the like. The areas from which each of the products would be secured would be quite precise, and the price structure would be such as that set forth in figure 18. Differences in sanitation regulations for milk sold in different forms merely operate to increase the price of fluid milk f. o. b. the city in relation to the products for which either none or less stringent sanitation regulations are in effect, and the milk-price structure would be such as that set forth in figure 19.

Consider now the case when there is a seasonal excess in milk production over fluid-milk requirements.

For purposes of presentation, it is assumed that: (1) During the period of low production the volume of production within a zone extending 200 miles from the marketing area is equal to market requirements for fluid milk; (2) the sanitation regulations are the same for all milk regardless of the form in which it is sold; (3) production varies seasonally, so that during the season of flush production the volume of milk produced within a zone extending 50 miles from the market is sufficient to meet fluid-milk requirements; (4) there is no

difference between the seasonal production curves of individual producers; and (5) there are no variations in consumption other than daily.⁹⁶ Under these conditions there are several lines of procedure which distributors might follow in purchasing milk from producers, such as: (1) Expanding and contracting the area from which milk is secured inversely to the expansion and contraction of milk production; (2) taking all the supply of milk produced within a given area (wherein the supply during the period of low production is just sufficient to meet the market requirements for fluid milk) and paying producers prices low enough to enable distributors to secure a high enough margin on fluid milk to cover the losses incurred in handling manufacturing milk during the period when supplies are larger than fluid requirements; or (3) purchasing milk from producers under a price arrangement which encourages producers to produce an even volume of milk throughout the year.

If distributors elected to secure their market requirements for fluid milk by contracting and expanding the area from which they draw their supplies inversely to the seasonal variation in production, refusing to take the production of distant shippers during the season of low production, the zones from which fluid milk would be drawn at different periods of the year would show marked difference from that shown in figure 18. If, during the period of low production, the volume of milk produced in the area within 200 miles of the market were sufficient to meet fluid requirements, the volume of milk produced within this zone would be far in excess of fluid requirements during the period of heavy production. For example, if the volume of milk produced during the peak-production period were about 25 percent above that produced in the low-production period, the area of the milkshed would be markedly contracted, about 25 percent in area if the density of production were constant throughout the area, but more than this if, as is often the case, the density of milk production declines as distance from market increases.

With a given price f. o. b. the market during the period of low production, the f. o. b. market price during the period of high production would be less than the f. o. b. market price during the season of low production by an amount equal to the saving in transportation costs involved in securing the supply of milk closer to the market during the flush period, and would vary between these limits during the year, depending upon the extent of the area wherein the volume produced was needed to meet fluid requirements. The farm prices would vary in the same manner, being equal to f. o. b. market prices less the cost of transporting milk to the city.

There are several factors, however, that operate to cause distributors to secure their milk from the same area throughout the year, rather than to expand and contract the geographical scope of their operations to secure only that milk needed to meet fluid-milk requirements. It is a matter of concern to the distributor that he be assured of a volume of milk sufficient to meet his market needs. Therefore, the risk involved in dropping a source of supply during the season of flush production, when it is probable that that source will be needed during the season of low production, is a factor operating to check such action, since the distributor can never be certain that some

⁹⁶ For ease in presentation, the examples used to explain certain points are stated in terms of fluid milk only throughout the remainder of this paper.

competitor will not immediately furnish the shippers he dropped with an outlet for their milk, thereby forcing him to seek even more distant sources of supply during the season of low production.

Another factor of importance in this connection is that of the costs of procuring milk from a rather constant area, as compared to the cost of procuring milk from an area that varies markedly throughout the year both in geographical extent and in the number of individual sources of the raw material. It undoubtedly costs less to procure milk from an area that stays rather constant than from an area that varies markedly throughout the year in geographical extent and number of producers, other factors being the same. Some of the savings are (1) lower costs of procurement, (2) lower bookkeeping and office expense because of the fewer number of producers for whom accounts must be kept and statements prepared, and to whom payments must be made, (3) fewer laboratory tests and resultant savings in laboratory technician labor costs, laboratory supplies, etc., and (4) fewer individual containers to be handled, with resultant savings in receiving labor, can washing, and sampling. It appears, then, that distributors can afford to pay producers a premium for evenness of production, so that they may, through the payment of such premium, secure the volume of milk needed by them to meet their fluid-milk requirements from an area smaller in geographic extent and in numbers of individual sources of supply, rather than to secure their supply from an area that contracts and expands markedly as production increases and decreases seasonally. The amount of the premium distributors can afford to pay in this connection is the difference in the costs of procuring their milk supply from an area that remains practically constant in geographical extent and in number of individual sources of supply, and the cost of procuring milk from an area that varies markedly in geographical extent and in the number of producers from whom milk is purchased.

There is another factor that tends to cause the distributor to pay producers a premium for evenness in production. It has been pointed out that a volume of milk perhaps 10 percent in excess of average daily sales must be brought to market to meet daily variations in the volume of milk sold to consumers as fluid milk. In order to handle this volume of excess milk, the daily operating reserve, the distributor has to integrate a byproduct enterprise with the main enterprise, or find some other channel of disposal. However, this reserve is small, and the question as to whether it is handled efficiently is not so important as the same problem regarding the seasonal excess. It is the marked variation in the seasonal excess and the difficulty of handling it efficiently that is an important factor in leading distributors to endeavor to secure a more even volume of supplies. This arises because more efficient methods of handling the excess can be developed when the supply is constant than when it varies markedly. Thus during the season of flush production the distributor has to convert to other uses, or someone else does it in his stead, a volume of milk that may be several times as great as the volume so converted during the season of low production. This may be demonstrated by reference to some assumed figures, as follows:

(1) The volume of milk sold daily as fluid milk throughout the year is 10,000 pounds.

(2) The volume of milk brought to market is 11,000 pounds (10 percent of average daily sales needed to meet daily variations in fluid-milk sales) in the season of low production and 14,000 pounds during the season of flush production.

The volume of milk that is diverted to uses other than fluid milk is therefore 1,000 pounds per day during the season of low production and 4,000 pounds per day during the flush period, or 3,000 pounds greater than during the low period. This is entirely a seasonal excess (3,000 pounds of the 4,000) and represents an increase in the output of products other than fluid milk of 300 percent. Of course, under actual conditions the increase in the volume of milk diverted to uses other than fluid during the flush season will be dependent upon the actual seasonal variation in production, which will in some cases be greater, and in other cases less, than that indicated in the example above.

The seasonal excess in production therefore raises serious questions as to how it may be handled efficiently. It undoubtedly costs far more to handle a volume of excess milk that fluctuates markedly from season to season, as does a seasonal excess, than it costs to handle a volume of milk that remains rather constant from season to season. This is due to the fact that equipment, and in many cases labor, must be available to handle a peak load far in excess of the load during the period of low production when only a small volume of milk, equal to about 10 percent of average daily sales, is converted to uses other than fluid milk.

The foregoing indicates that, from the standpoint of efficiency of operation, distributors may be able to pay a premium for evenness in production. It appears that it would be a matter of indifference to distributors whether they paid a given sum of money, including premiums for evenness of supply, to secure a particular volume of milk, or paid the same sum of money for a similar volume of milk, the latter sum, however, being paid partly to producers delivering an uneven volume of milk, and partly for extra costs involved in procuring milk from a varying area. In the former case the farmer gets a higher percentage of the total volume of money expended by the distributor for milk purchases and operating costs, than in the latter case, but total costs to the distributor probably would remain about the same. It is probably a matter of indifference to distributors whether they pay out a given sum of money in the one manner or the other. If distributors elect to secure their milk supply without paying producers a premium for evenness in production, it is evident that the seasonal variation in producers' prices may be quite marked.

It is, obviously, more economical to secure milk that is to be sold as fluid milk from sources near the market and to process the seasonal excess into milk products other than fluid milk at points outside the area wherein production is just necessary to meet fluid requirements, since the cost of transporting the fluid-milk equivalent of manufactured dairy products from any given point is much greater than that of transporting such products to market in finished form. Of course, the extent of the saving will depend upon the size of the area and similar factors. Thus during the period of flush production fluid milk would be drawn from a point much nearer to market (depending upon the seasonality in production and relative density of production throughout the area) than during the season of low production. F. o. b. market prices for fluid milk during the year would vary directly with differences in costs of transporting milk from different points within the area. Thus, if milk is transported only 50 miles during the flush period and 100 miles during the low period, f. o. b. market prices, assuming transportation costs of 0.2 cent per hundredweight

per mile, would vary within a 10-cent range during the year, being 10 cents higher during the period of low production than in the period of high production. Farm prices would vary in the same manner, being equal to f. o. b. market prices less transportation costs.

If, however, milk is brought to the market in fluid form and is then diverted to more concentrated forms such as cream, evaporated milk, and butter, the product equivalent of such milk will sell at prices f. o. b. the market about equal to the price at which the product can be shipped to the market from a distant area. Thus, if the butter equivalent of a hundredweight of milk can be brought to the market from distant sources for \$1 f. o. b. the market (farm price plus transportation costs on the butter equivalent of 100 pounds of milk), the butter equivalent of milk brought to the city in fluid form will sell for only \$1 f. o. b. the market. The farm price of such milk would be materially less than \$1 per hundredweight. For example, if milk is shipped 50 miles and transportation costs are 0.2 cent per hundredweight per mile, the cost of transporting a hundredweight of such milk is 10 cents. If the product equivalent of such milk sells for \$1 f. o. b. the market, then the farm price of such milk would be 90 cents. Of course, if such milk is shipped any great distance as fluid milk, the product equivalent f. o. b. the market may sell for little more than enough to cover transportation costs from the farm to the market. Therefore, if milk is shipped to the market in fluid form for any appreciable distance and then converted to more concentrated products, farm prices for milk are decreased appreciably. Under these conditions the seasonal variation of prices paid producers would be much more pronounced than that obtaining under the conditions treated previously.

9. The effect of seasonal variation in production upon the price structure for milk—varying quality requirements.—The seasonal variation in prices to producers would be even more marked than under the conditions treated above if there were higher quality requirements for milk produced for use as fluid milk than for milk produced for use in other products.

This can be demonstrated quite readily by reference to the following example, wherein it is assumed that: (1) Distributors bring to the market only that milk needed to meet their fluid requirements, which are assumed to be constant; (2) the area from which the fluid milk is drawn is contracted and expanded inversely to the seasonal variation in production; (3) distributors contract with producers to take their milk only for the periods wherein it is needed (obviously, under such an arrangement the milk of some producers would be used as fluid milk all of the time while that of others would be so used only at certain specified seasons in the year); (4) the cost of meeting sanitation requirements, if all milk were sold as fluid milk during the year, would be 20 cents per hundredweight per producer; (5) the alternative farm value of milk sold for any other purpose is \$1 per hundredweight; (6) transportation costs vary uniformly with distance; and (7) during the season when the milk of producers in outlying areas is not needed for fluid-milk uses, there are plants available for manufacturing it into other dairy products.

Under these circumstances the total yearly cost of meeting fluid-milk requirements for outlying producers, or, rather, for those producers who sell their milk as fluid milk for a short period during the

year, would have to be covered in a much higher farm price for the months during which they sell their milk as fluid milk.⁹⁷ Under these assumptions a producer selling his milk as fluid milk during the entire year would incur only 20 cents per hundredweight additional expense for meeting sanitation regulations. On the other hand, the producers who sold milk as fluid milk 1 month of the year would incur equal expenses over the entire year, or approximately 12 times as great per unit for the month during which such milk is sold as fluid milk. Thus during the season of low production the farm price must be sufficient to cover, during 1 month, the entire cost of meeting sanitation regulations for the entire year which, in the assumed case, would amount to approximately \$2.40 per hundredweight above the alternative use value for milk at the farm. Thus there would be a marked seasonal variation in f. o. b. city and farm prices under the conditions assumed.

It should be noted that the marked seasonal variation in prices, which in any particular market would be different from that set forth above, depending upon the degree to which conditions in the market and the supply area vary from those assumed in the example, would in time be changed to some extent by producers within the area changing their seasonal output curves in order to sell a larger volume of milk during the period when prices are seasonally high. However, it would be greatly to the advantage of some producers and little if any to others, to shift their seasonal output curves. The advantage would depend upon the type of farm organization and operation followed by each.

Heretofore it has been assumed, for purposes of analysis, that there is no difference between the seasonal production curves of individual producers. This assumption is now discarded and the analysis focused upon conditions more nearly in accordance with those that prevail in actual markets. It is well recognized that there are marked differences between the seasonal production curves of different groups of producers as well as between those of individual producers.⁹⁸ Thus in any particular milk market there are many producers who produce milk practically in accordance with fluid-milk needs, while others do not. However, the very fact that the milk of certain producers is more desirable from the point of view of the distributor introduces an element of complex competition into the producer side of the picture, that is, the product of individual producers now becomes somewhat differentiated from others. On the other hand, it is highly probable that the product of other producers is differentiated in the same manner; hence, there would be group- rather than individual-producer product differentiation. Under these conditions it is highly improbable that the volume of individual producers within the differentiating group would be large in relation to the total of the group, and there would be no incentive to vary their production in order to affect their prices. Only if the group were acting together would it be possible for them to influence their market prices, and in any case the maximum gain they could expect to receive by such action would be the difference in price which the distributor would be willing to pay for milk furnished him in an even volume and that furnished him in an uneven volume.

⁹⁷ Of course, part of the expense of producing milk in conformance with the sanitation regulations is fixed, and part is variable. This introduces an additional complexity, and probably operates to change the seasonal price curve from that set forth in this analysis. However, it does not appear necessary for the purposes of this paper to develop this point further.

⁹⁸ See ch. 3, sec. II.

In almost any milk market (except in small villages and towns where practically all of the milk is distributed by producers) where the economy of the market has developed to the point that distributors have become specialized, different degrees of specialization obtain between distribution units (plant units). Some distribution units sell only fluid milk and/or cream, others sell only fluid milk and/or cream and a relatively small volume of manufactured byproducts (butter, cheese, ice cream, etc.), and still others sell some fluid milk and cream and sell a relatively large volume of manufactured dairy products. Within the same area other processing units produce and sell manufactured dairy products entirely. In other words, all degrees of enterprise combinations are to be found, ranging from the highly specialized fluid milk distribution unit to the relatively as highly specialized manufactured dairy products unit.

Under the conditions above it may appear that it is to the interest of all fluid-milk distribution units and all manufactured dairy products units within a particular area to pay producers in such a manner that evenness in production is encouraged rather than for specialized fluid milk distribution units to do this alone. This is true to a certain extent. However, milk is bulky and perishable and the storage of milk is not economically feasible. On the other hand, manufactured dairy products can be and are stored for relatively long intervals. Thus manufactured dairy products are produced in largest volume during the spring and summer months and are stored until they are moved into consumption. This tends to even out the seasonal variation in the prices of manufactured dairy products. Under these conditions the premium that could be paid producers of milk for use in manufactured dairy products to encourage evenness in supply would be equal to the cost of storage from the flush production period until the product moves into consumption plus the savings realized in manufacturing costs when the volume of product produced throughout the year is constant rather than varying, other factors being the same. In addition, the supply areas of individual manufacturing plants are in most cases much smaller than the supply areas of individual fluid-milk plants so that transportation costs do not affect farm prices seasonally to so great an extent as in the case of fluid milk. Also, sanitation requirements are usually less stringent with respect to the production, care, and handling of milk produced for use in the production of manufactured dairy products as compared to those applicable to milk produced for use in the fluid-milk trade. Thus sanitation requirements for milk produced for use in the production of manufactured products do not operate to increase the seasonal variation in the price of such milk to any appreciable degree; certainly, in any case, to a much lesser extent than in the case of milk produced for use as fluid milk. These considerations suffice to explain in some measure why pricing systems pointed to encouraging evenness in production have not developed with respect to milk produced for use in manufactured dairy products.

In view of the foregoing, it appears that there is a wide range in the incentive of different types of distributors to pay producers in a manner that encourages evenness in production. For specialized fluid-milk distributors this incentive is quite strong and diminishes in strength with the diminution in the degree of specialization of

distributors until, in the case of manufacturers of manufactured dairy products, there is relatively little incentive to purchase milk from producers so that evenness in production is encouraged. Under these conditions fluid-milk distributors might compete with each other to secure the patronage of those producers who produce a rather constant volume of milk throughout the year so that these producers might become associated with specialized fluid-milk distributors. If so, producers with a more variable volume of milk would tend to become associated with less specialized distributors. Stated in other terms, when producers are classified on the basis of their relative seasonality of production they might tend to be directly associated with distribution units in accordance with their relative constancy of production and the relative strength of the incentive of different classes of distribution units to secure an even volume of supply of the raw material. Thus within a milkshed different producers would tend to receive different prices for milk, such differences, after adjustment for location differences, being due to relative differences in the seasonal variation of production of various producers. Under these circumstances, provided economic forces have time to work out their full effect, producers of a relatively constant volume of milk throughout the year would tend to receive higher prices than those who produce a relatively more variable volume of milk throughout the year. Further, the producers of a relatively constant volume of milk throughout the year would tend to be associated with highly specialized fluid-milk distribution units (highly specialized in the sense that the operating unit is engaged almost entirely in the distribution of fluid milk), while those who produce a relatively more variable quantity would tend to be associated with distribution units which are less highly specialized (in the sense noted above).

In addition to the foregoing, with a given seasonal variation in market prices, producers with different seasonal output curves will receive different weighted average prices for the year. Those producers who have a seasonal variation in production inverse to that of the area as a whole will receive the highest weighted average prices, those producing an even volume throughout the year will receive somewhat lower weighted average prices, while those who have a seasonal variation in production comparable to that obtaining in the area as a whole will receive still lower weighted average prices, other factors being the same. Thus, under the conditions assumed, inverse and even producers will receive higher weighted average annual prices than those having the same seasonal variation in production as that for the area as a whole, regardless of whether distributors pay them (the even producers) a specific premium for even production.

IV. THE GENERAL THEORY OF MILK PRICES UNDER CONDITIONS OF COMPLEX COMPETITION IN BOTH MILK PRODUCTION AND MILK DISTRIBUTION

The theory of milk prices has been treated under assumptions of simple competition with respect to both production and distribution in section I of this chapter, and under assumptions of complex competition in milk distribution and of simple competition in milk production in section III. In section I consideration of the price structure was focused largely upon the relationship between prices of milk sold in

different forms; and the influence of such factors as sanitation regulations and differences in transportation costs of milk and the product equivalent of milk upon the price structure was set forth. The discussion in the preceding sections of this chapter was pointed, first, to an understanding of the major factors accounting for the course of milk prices to consumers on a daily and seasonal basis. Attention was then directed to the farm-price structure, with major emphasis given to a consideration of the influence of the seasonal excess upon the seasonal course of prices to producers. It is evident that none of the theory already set forth explains the development of the classified-price plan (described in ch. 2, sec. II) of selling milk to distributors, nor the rating or other plans of prorating among producers the proceeds of sales to distributors (described in ch. 2, sec. III). True, under rather rigid assumptions it was pointed out that producers would receive different prices, depending upon their relative evenness of production and the type of distributor with which they were associated, but the fact remains that, under the conditions assumed, milk brought to the city as milk would command a series of prices, the higher prices being paid to more uniform producers and the lower prices being paid to less uniform producers. Cream, butter, etc., would be brought to the city in product form, and price quotations would be stated in terms of product. Milk would not be brought to the city in fluid form and sold for different prices according to use; i. e., that portion sold as fluid milk commanding one price and that converted into and sold as cream, butter, and other products commanding other prices. A portion of the milk brought to the city as milk would be sold as cream and other dairy products, because of the daily and seasonal excess of milk receipts as compared to fluid-milk sales, but the milk used in the several products would not be priced on a use basis.

In this section the milk-price structure is considered under assumptions of complex competition in both milk production and milk distribution, the assumptions of this section differing from those employed in the previous section in that the assumption that milk production (used herein synonymously with the phrase "sale of milk to distributors") is carried on under conditions of simple competition is dropped. The major purpose of the section is to ascertain the effect of large-scale organization of supply, taken in conjunction with conditions of complex competition in milk distribution, upon the price structure for milk.

The facts and considerations concerning large-scale organization of the milk supply were set forth in chapter 2, section I. There it was shown that in many milk markets a large portion of the market supply is sold by the cooperative association, or at least is sold on the basis of a scheme of prices bargained for by the cooperatives. In other words, although the production of milk is carried on by numerous producers, each of whom produces an insignificant portion of the total amount of milk produced in the supply area, the sale of such milk is handled practically as a unit. In section II of chapter 2 a brief account of the development of the classified-price plan of selling milk to distributors was set forth.

This phase of the discussion of the price structure for milk in complex markets, such as those widely prevailing at the present time, can now be brought rapidly to a close. As was pointed out above, none

of the theory already advanced explains the reason for the development of the classified-price plan of selling milk to distributors. This is because the major element necessary for the formal development of such a price plan, namely, large-scale organization of the supply, has not been introduced. Once this element is introduced the entire structure becomes subject to simple ratiocination in a general way. The possibilities for the development of price plans and policies become readily apparent once the multitude of small producers negotiating independently with distributors is replaced by an overhead organization that acts as their sales agent. The reasons why cooperatives developed the classified-price plan of selling milk to distributors are more or less obscure, and perhaps will remain so unless painstaking research into the historical aspects of price bargaining by cooperatives is undertaken. It is exceedingly difficult to generalize in this matter because the literature dealing with it is quite scanty.

Following the generally accepted principle that, by and large, business institutions operate in a manner that they consider most conducive to their interests, it appears reasonable to believe that classified pricing has become the ruling method of sale to distributors in most large markets because experience has proved that such a method may obtain for a given volume of milk a larger sum of money than might be obtained by other methods which might have been developed. This statement is strongly supported by the theory of commodity price discrimination, advanced in chapter 5, section IX. On the other hand, it may have developed because of its convenience, as is suggested in chapter 2, section II, that is, because it is a rather convenient method of evaluating milk for purposes of sale to distributors. In any case, the institutional aspects of the matter must be realized before it is possible to obtain real understanding of the operations of the larger milk markets. Once these aspects are realized, inquiry into the economics of the milk trade is facilitated and proper emphasis can be placed upon ascertaining the influence of large-scale organization of the supply and of the distributive phase of the milk trade upon the price structure for milk. It is indeed a difficult matter to measure the relationships between various factors in the trade without a clear conception of how institutional factors may operate so that the relationships studied are changed, or differ, from those that would be found in simple markets or in more complex markets where producers are unorganized. Of course, in unorganized markets there tends to be a rough differentiation of milk prices according to use, but it is only when organization of the supply becomes an important factor in the trade that milk is sold formally on the basis of the use made of it by distributors, regardless of whether it is shipped to the city in the form of fluid milk. Once the economic setting necessary for the development of such a plan exists, the price structure may be changed materially from that obtaining prior to the institution of the plan and can hardly be fully understood in any given situation without taking cognizance of the forces playing upon the persons directing the plan and without studying the means or methods by which they arrived at given price structures and made them the ruling element, or at least the basis, of pricing milk to distributors in the market.

Large-scale organization of the supply is also necessary for the development of formal pooling, i. e., the development by the cooperative of rules and regulations pertaining to the manner in which the proceeds

of sales to distributors will be prorated to producer members. Once a classified-price plan is put into operation, the problem arises of prorating among producers the proceeds of sales to distributors made on the basis of the classified-price plan in effect in the market. It is only by developing formal rules and regulations for proration that the cooperative can be assured that producers will not be paid in a discriminative manner, or by its system of proration develop a farm-price structure designed to be in the best interest of the cooperative. Formal pooling thus is practically a natural concomitant of formal methods of pricing milk to distributors. As with classified-price plans, it is not feasible to generalize as to the reasons why particular types of pooling plans (described in ch. 2, sec. III) are developed in different milk markets, since the answer to such questions can be given only after analysis of the conditions affecting the various markets.

V. SUMMARY

To summarize the development of the theory of milk prices to this point:

(1) In simple markets where: (1) All of the milk used for dairy products is brought to the market as fluid milk; (2) there is no variation in production and demand from day to day; (3) distributors and producers each handle a volume so small relative to the total volume sold in the market that it has little influence on the market price; (4) sanitation regulations are the same for all milk; and (5) products are not differentiated, there would be no differentiation in the price of milk according to use, since each unit of the supply would be interchangeable with every other unit.

(2) If sanitation regulations applicable to milk produced for use as fluid milk are more stringent than those applicable to milk used in the manufacture of dairy products, the price of milk produced for use in the fluid-milk trade will tend to be higher than that produced for use in manufactured dairy products by an amount necessary to cover the additional costs of quality production.

(3) In many areas it is economical to manufacture dairy products at some distance from the market and transport them to market in product rather than fluid form, because of the markedly higher cost of shipping fluid milk than of shipping milk in product form. In such cases the supply area will tend to be zoned, with the bulky and more perishable products, such as fluid milk, produced in the zone or zones nearer the city and the manufactured dairy products produced in more distant zones.

(4) Variations in demand and supply operate to cause changes in the price structure and in the areas from which the various products are secured. An increase in the demand for fluid milk, other factors remaining constant, will tend to cause an increase in the price for milk produced for fluid use in relation to the price of milk produced for use in other dairy products, and vice versa if there should be a decrease in demand. An increase in supply in the area producing milk for use in fluid milk will tend to cause a reduction in the price of milk produced for use as fluid milk in relation to the price of milk produced for use in other products, and will also tend to cause a reduction in the supply area for fluid milk. The opposite results would obtain if there were a decrease in the supply in the fluid-milk supply area.

(5) Seasonal variations in supply in simple markets tend to be associated with seasonal variations in the retail prices of fluid milk and the farm prices of milk produced for use as fluid milk.

(6) In more complex markets, where the major portion of the trade in fluid milk is handled by a few large distributors and where products tend to be differentiated, distributors tend to hold retail prices constant for considerable periods of time, that is, there is little if any daily and seasonal variation in retail prices. This results in changes in demand being manifest in larger or smaller volumes of sales at constant prices. Also, instead of retail prices being adjusted when supplies increase or decrease seasonally, they stay constant, so that the increase in production during the season of flush production is diverted to uses other than as fluid milk, resulting in the development of the seasonal excess and the operating reserve. Under these circumstances the farm price of milk varies inversely to the

seasonal variation in production, and differs from that obtaining in simple markets depending upon (1) how distributors elect to secure their milk supply, whether by expanding and contracting the area from which they secure milk or by taking all of the milk within the area throughout the year, and (2) how the additional costs of meeting sanitation regulations are covered on a seasonal basis. Also, there may be a tendency for distributors to pay even producers a premium, and in any case producers with different types of seasonal output curves will receive different weighted average annual prices, the producers who reach the peak of their production during the winter months when prices would normally be high receiving the highest average annual prices, even producers somewhat lower prices, and producers having a seasonal variation in production comparable to that for the market as a whole receiving still lower prices.

(7) In still more complex markets where the supply is organized, milk is usually sold to distributors on a schedule of prices according to the use made of such milk by distributors. Milk used for distribution as fluid milk usually commands one price, and milk used for other dairy products other prices, etc. This type of pricing milk is largely institutional in nature, and the economic setting necessary for its development appears to possess one of the major attributes of complex competition, namely, large-scale organization of the supply. Once this situation obtained, the problem of how to dispose of the surplus and of pricing milk to distributors operating under widely different methods of disposal of the surplus and with varying proportion of surplus led to the development of classified-price plans on a formal basis applicable in most cases to a large portion of the market supply. Also, the possibilities of enhancing money income from a given volume of milk through the practice of commodity price discrimination may have had some influence on the development of the classified-price plan of selling milk to distributors.

(8) The various methods of prorating among producers the proceeds of sales to distributors (formal pooling) are concomitants of formal methods of pricing milk to distributors, and, as in the case of the latter, their origin is found in the economic setting brought about by large-scale organization of the supply, i. e., conditions of complex competition in the sale of milk to distributors. The reasons for the development of a given method of proration in a market rather than other methods must perforce await analysis of the factors affecting the marketing of milk in that market.

Thus the theory presented explains the development of the classified-price plan of selling milk to distributors and the development of formal methods of prorating among producers the proceeds of sales to distributors, and it develops the explanation of the seasonal course of prices and the structure of such prices in various types of markets.

In the next chapter some problems in pricing milk will be presented and the theory of milk prices will be further developed.

CHAPTER 5

SOME PROBLEMS IN PRICING MILK F. O. B. THE CITY

I. INTRODUCTORY

In this chapter some problems encountered in the establishment of milk prices f. o. b. the city are discussed. Attention is first directed to a discussion of factors affecting the level of milk prices.

Any consideration of the problems encountered in pricing milk f. o. b. the city and in the appraisal of milk prices that may be established in any particular market, necessarily involves the problem of what prices should be established in the market, for the reason that the establishment of prices and a price structure having elements of soundness must necessarily take cognizance of the economic situation in the market, and must, in the case of appraisal, make available some basis of comparison. One method of arriving at what the price should be, or what price can be secured, putting aside for the moment the possibilities of arbitrary pricing through monopoly control, is to determine the price that is necessary to bring milk to the city, that is, to attract it from other uses, the alternative market, and cover any additional costs of transportation, handling, and quality production. By and large, it would appear possible to approximate what the price for any given volume of milk f. o. b. the city should be by taking the farm price of milk in alternative uses at the point at the outer edge of the milkshed from which it would be necessary to bring milk in order to secure the desired supply, adding thereto the cost of transporting the milk to the city, and the amount required to induce producers to produce milk of a quality sufficient to meet the health regulations. This method, although difficult, at least furnishes an estimate of what the price of milk f. o. b. the city should be, in the sense that it is the price that should be expected to be forthcoming under simple competitive conditions in the sale of milk to distributors. For purposes of convenience this built-up price may be called the competitive price of milk f. o. b. the city.

II. SOME FACTORS AFFECTING THE PRICE OF MILK F. O. B. THE CITY, UNDER ASSUMPTIONS OF SIMPLE COMPETITION IN THE SALE OF MILK TO DISTRIBUTORS

In this section the whole matter of demand will be ignored, and the supply side of the problem will be examined not from the standpoint of cost of production as such but from the standpoint of what distributors may be expected to have to pay for milk f. o. b. the city under given circumstances pertaining to competing uses for milk, costs of meeting sanitation regulations, the cost of transporting milk to the city from the outermost point from which milk must be shipped to meet the demand in the market, and other factors. For the person

engaged in selling milk, or specifying the prices at which milk will be sold in any particular market, a part of the problem is that of constructing the price structure for milk in the milkshed. The manager of a milk cooperative has a problem far different from that of the manager of, say, a cotton-marketing cooperative. The manager of the cotton cooperative has to decide whether or not he will sell cotton at certain prices based on the exchange quotations. The manager of the milk cooperative has no such guide.⁹⁹ He has to estimate as best he may the prices he can hope to secure for his product, and a part of this computation will necessarily relate to constructing the milk-price structure for the area. This is the case because in most instances the prices that the cooperative establishes will apply to most of the milk in the market, i. e., the price established by the cooperative f. o. b. the city, and the farm-price structure resulting therefrom will become, for all practical purposes, the ruling price structure for the market.

In estimating the competitive price it is necessary to take into account the farm price for milk sold in alternative uses at the outer edge of the zone from which milk and cream are brought to market, since, unless the market is restricted, the milk being produced for use in dairy products other than fluid milk and cream comes into direct competition at this point with milk being produced for use in fluid milk and cream. Thus, should the farm price of the latter get out of line with the farm price of the former, the producers will tend to shift to the relatively more favorable enterprise.¹

Several difficulties are encountered in computing the competitive price. It is sometimes quite difficult to determine just what price farmers are receiving for milk delivered to evaporated-milk plants, butter plants, and cheese factories, but this is probably not an insuperable difficulty. A more important difficulty arises in determining the edge of the zone from which milk and cream are brought to the city, largely because this zone is not too clearly defined.²

There is room for wide error and for the establishment of prices that are arbitrary, at least for short periods of time, in this factor alone. For example, assume *or* the price of the butter equivalent of 100 pounds of milk f. o. b. city and *rk* the farm-price structure associated with such price. (See fig. 31.) In order to evaluate the effect of an error in the determination of the milk zone (in the interest of convenience in presentation only two products, milk and butter, are considered), assume that the quality of milk produced for use as fluid milk and as butter is the same. Assume *ov* the actual extent of the fluid-milk area, and *vt* plus transportation costs per unit of milk results in an f. o. b. city price of *op*. If, however, it is determined that the fluid-milk zone extends to *ov'* and prices are established on that basis, the f. o. b. city price for milk in fluid form³ would amount to *op'*, and prices would be arbitrary by the amount *pp'*. Under such conditions

⁹⁹ He may know what cooperative managers in other markets are securing for their milk but this information may not be very useful as a guide to price policy because of different conditions in different markets.

¹ See ch. 4, sec. I.

² "The boundaries between the zones will not be hard and fast lines. Because of special circumstances of the sort named above, some producers 5 miles nearer the market may not attempt to meet the sanitation standards at the differentials that market forces establish; and some 5 miles farther out may consider the differentials well worth the effort, even after allowing for the freight differential in each case. The boundary is therefore a band or zone within which part of the dairymen dispose of their dairy output one way and some in another. If a line had to be drawn, it would be at the point of the average where half of them choose each method of disposal." Black, John D., *The Dairy Industry and the AAA*, ch. VI, p. 164.

³ The complexities introduced into the problem by the seasonal excess are assumed in this discussion to be nonexistent.

it would be to the interest of producers in the area vv' to shift from the production of milk for butter to the production of milk for fluid use, forcing a readjustment of the price structure unless the market were restricted. Similarly, if $p't'k$ is assumed to be the correct price structure, underestimation of the extent of the milkshed would result in prices being arbitrarily low by the amount $p'p$, and producers would tend to shift in the direction opposite to that set forth above. Also, it may not be feasible to determine merely where the milk originates at the time the price is being determined, since the size of the shed at that time may be partly a function of an arbitrary price structure. If this is the case it would be necessary to ascertain the area from which milk should be brought in order to meet the demand in the market. This is an extremely difficult problem, partly because of the mass of data that would have to be collected and analyzed and

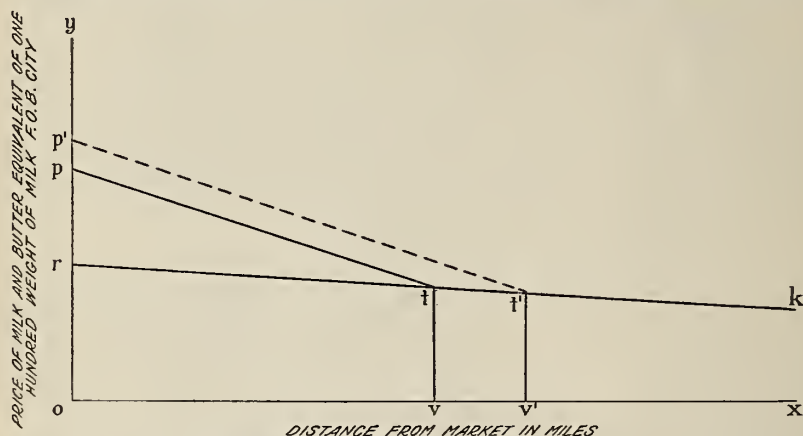


FIGURE 31.—Errors in the price structure engendered by improper determination of the milk zone.

partly because the influence of some degree of arbitrary pricing upon the production of milk within the area probably would have to be eliminated.

Another difficulty in estimating the competitive price is that of making an allowance for the additional costs of meeting sanitation regulations on milk produced for use as fluid milk. It is difficult to develop cost figures that really mean anything, and even if it were possible to develop accurate figures costs would vary materially between different producers and it would be necessary to decide which cost figure to take—high, average, or modal. It is generally recognized that production of milk for use as fluid milk entails higher costs of production, other factors being the same, than does the production of milk for use in other dairy products, on account of the additional expense involved in producing milk that will qualify under the more stringent requirements applicable in most milk markets to milk produced for use as fluid milk. Hence in estimating the competitive price it is necessary in the calculations to make some allowance for this factor. Perhaps the figure finally accepted will be one based largely on the judgment of persons familiar with the manner in which the sanitation regulations affect production conditions in any particu-

lar market, but in any case the allowance made, if incorrect, results in some degree of arbitrary pricing, even though there may be no intent to price milk on an arbitrary basis. Thus assume the correct prices for the butter equivalent of a hundredweight of milk and per hundredweight of milk used as fluid milk to be or and op' , respectively, and the farm-price structure associated therewith to be $p't'k$, the allowance for the cost of meeting sanitation regulations being $t'n$. (See fig. 32.) If, however, the allowance for quality is placed at tn , milk prices would be arbitrarily low by the amount tt' and would probably be associated with a shift away from the production of milk for use as fluid milk to the production of milk for use in other dairy products.

The same sort of results is secured if improper allowances are made for transportation costs, country-station charges, etc.

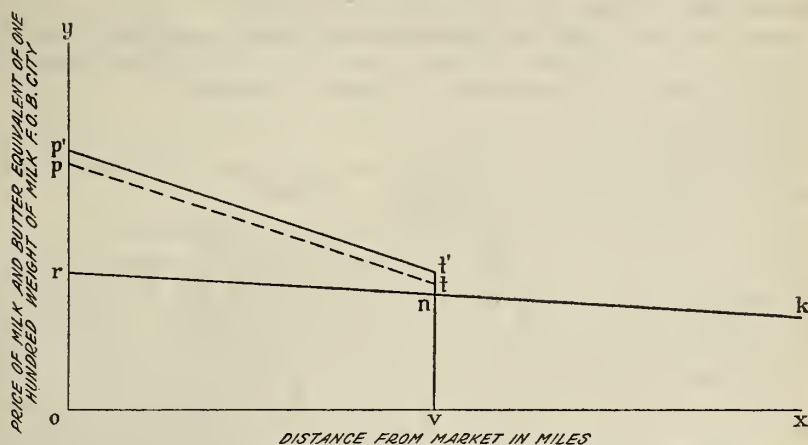


FIGURE 32.—Errors in the price structure engendered by improper allowance for cost of meeting sanitation regulations.

Generally speaking, prices established on the basis of a built-up competitive price are likely to have an arbitrary element in them unless the estimates are very carefully made and revised from time to time on the basis of experience in operation and changing conditions. Furthermore, the price so computed ignores the effect of organization of the supply upon milk prices, which, as is pointed out in the following section, is of material significance. Subject to these reservations, estimated competitive prices have some value as a basis for determining whether, and the extent to which, prices in any particular market are arbitrary.

III. THE EFFECT OF ORGANIZATION OF THE SUPPLY—ADDITIONAL FACTORS TO BE CONSIDERED IN THE PROBLEM OF MILK-PRICE DETERMINATION

As was pointed out in chapter 2, in most large cities the larger portion of the milk supply is sold to distributors by one or more associations of milk producers. These associations indubitably have some effect upon the price of milk (see ch. 4), certainly upon the prices received by their members, and any consideration of the problem of milk prices should take account of that fact. The question becomes

one of ascertaining the extent to which milk prices are influenced by the cooperative, and in what direction. This necessitates a consideration of the activities of cooperatives.

Cooperative associations of milk producers can be grouped into three broad categories, as follows:

(1) *Bargaining cooperatives.*—The primary function of this type of cooperative is to act as sales agent of member producers, that is, to negotiate the prices and terms and conditions of sale of the members' milk. The strictly bargaining type of cooperative does not engage in the physical handling of the product, in the sense of distributing milk to consumers.

(2) *Distributing cooperatives.*—These associations are distinguished from the bargaining cooperatives by the fact that they operate plants engaged in the processing and distribution of milk.

(3) Associations which are engaged primarily in the bargaining function but also own some facilities for handling the milk at some point along the road to the consumer, such as country receiving stations and the like.⁴

While the principal function of the bargaining cooperative is that of acting as sales agent in selling members' milk to distributors, it may render several other services in addition, such as:

- (1) Checking weights and tests.
- (2) Guaranteeing members a market.
- (3) Conducting educational campaigns and endeavoring to increase the consumption of milk by sponsoring advertising campaigns.
- (4) Guaranteeing payments to producers.
- (5) Servicing distributors with respect to their milk requirements.

The feeling on the part of farmers that distributors were not properly weighing and testing their milk constituted one of the reasons why producers organized into cooperative marketing associations.⁵ The importance of this factor is somewhat difficult to evaluate, nor is its importance in regard to milk prices readily determinable. On the whole, it seems reasonable to believe that, if producers thought they were being paid for less milk and butterfat than they delivered, they would have to be paid higher prices per unit as actually weighed and tested by the distributor. However, the offsetting factor here is the extent of actual underweighing and undertesting. Although distributors may have underweighed and undertested, the higher unit prices that probably would have to be paid on the basis of weights and tests reported were nominal in the sense that the total receipts of milk and butterfat were as a matter of fact somewhat larger than the volume used as a basis of payment; and prices paid, when considered in relation to the correct weight and test of milk received, would be somewhat lower than nominal prices. This problem is somewhat similar to that of plant loss and other wastage, which operates so that a distributor, although purchasing a hundredweight of milk from a producer, will undoubtedly be able to sell less than a hundredweight of milk or product equivalent, on account of loss in processing and handling. This probably results in a somewhat higher distributing margin than if there were no wastage, but it is difficult to see how the problem could have other than academic importance under simple competitive conditions. Under conditions of complex competition, however, the question has some relevancy. It is highly improbable that all distributors would follow the practice of underweighing and undertesting to the same extent. Under conditions where some dis-

⁴ See the classification employed by Metzger in *Cooperative Marketing of Fluid Milk*, Technical Bulletin No. 179, Bureau of Agricultural Economics, pp. 17-20, also Fetrow, Ward W., *Cooperative Marketing of Agricultural Products*, Farm Credit Administration, Bulletin No. 3, p. 22.

⁵ See ch. 2, sec. I.

tributors underweigh and undertest to a greater or lesser degree and others do not, distributors following this practice may be able to continue operating in the market, even though less efficient than other distributors who are properly accounting for their milk, since the practice is in reality merely a method of securing a hidden price reduction not available to their competitors. This being the case, such a practice probably results in keeping more distributors in operation than would be the case otherwise, with a resultant greater duplication in services, which tends to widen the spread between prices paid by consumers and prices received by producers. If efficient distributors follow this practice it is still difficult to see any justification for the practice from the standpoint of producers and consumers, unless, of course, producer groups have been successful in securing arbitrary prices, in which case underweighing and undertesting, being in the nature of a hidden price cut as far as the purchase price distributors pay for milk is concerned, may result in removing some of the arbitrary element that may be present in milk prices.

While it is extremely difficult to ascertain the effect of underweighing and undertesting upon milk prices and the price structure for milk, producers are much more satisfied when they have a check on the weights and tests given them by distributors, and it may be that, by and large, producers are willing to produce milk at a somewhat lower price than would be the case if they had no check on weighing and testing. For these reasons it appears reasonable to believe that checkweighing and testing by the cooperative may result in some reduction in the supply price of milk, provided that the tendency to lower supply prices is not offset by the cost of checkweighing and checktesting. In any case, checkweighing and testing may eliminate one factor that tends to stultify uniform pricing of milk to distributors, which, as is pointed out in chapter 7, is one of the factors associated with inefficiency in milk distribution.

Most milk cooperatives undertake to sell all of the milk produced for sale by their members.⁶ As was pointed out in chapter 2, one of the reasons for the development of cooperative associations of milk producers was that otherwise producers could not be sure of a market for their milk. There is considerable evidence to the effect that in many cases producers were notified to cease delivering their milk, and had to look for someone who would buy their milk, not always with a high degree of success, since the shutting off of producers tended to take place during the flush season when most distributors have plenty of milk. Once a producer was eliminated he had no assurance that he would be allowed to begin shipping again at some future date. Insecurity in market outlet would appear to increase the risk of milk production for the fluid-milk trade, and it would appear reasonable to believe that the elimination of such risk as is associated with an insecure market outlet would result in some reduction in the supply price of milk, other factors being the same. Hence the activities of cooperatives in securing for their members greater security in their market outlet may reasonably be classed under the category of cooperative activities that tend to decrease the supply price of milk, other factors being the same.

⁶ See appendix B for copies of contracts between associations and members. These contracts are thought to be fairly representative of the contract between a milk bargaining cooperative and its members.

Another type of activity of cooperative associations that is closely allied to gaining security of market outlets for their members pertains to guaranteeing that producers will be paid for the milk purchased from them by distributors. It is not an infrequent practice for certain types of distributors, mainly those in weak financial circumstances or the "in and outer" who does not intend to stay in the milk business, either to get far behind in their payments to producers and then become insolvent or to be conveniently missing when the time comes to pay producers. The cooperatives have done much to abolish this risk by being in a position to investigate the financial status of firms buying from their members. In addition, the spreading of this risk over all producers is in the nature of insurance, and lowers the risk of credit losses as far as the individual producer is concerned. The activity of cooperatives in guaranteeing members against credit losses can therefore be classified as one that tends to reduce the supply price of milk, other factors being the same.

Some cooperatives service distributors according to their milk requirements,⁷ that is, they deliver milk to distributors in the volume and form desired, some of them even going so far as to take back the distributors' route returns. Under such conditions the members of the cooperative will probably receive higher prices than other producers, unless the cost of rendering such service more than offsets the gains derived therefrom.

Another service that cooperatives sometimes render is that of bringing about a closer correlation between fluid-milk receipts and fluid-milk sales at the market center. It is not infrequently found that some distributors are short of milk during certain times in the year and have to obtain additional supplies from outside the usual supply area, while at the same time other distributors have a considerable volume of excess milk. With sufficient milk in the market to cover fluid-milk sales there seems to be little justification for going outside the usual supply area to bring in milk, since someone undoubtedly has to pay the unnecessary transportation costs involved in such transactions. Some cooperatives are in a position to shift milk among distributors and thus tend to eliminate this additional cost.

The foregoing considerations indicate that there are economies in large-scale organization of the supply. Some of the factors treated may reasonably be expected to be associated with lower supply prices of milk, other factors being the same. Others indicate that the cooperative may be able to secure for the milk of its members higher prices than independent producers receive, on account of services rendered distributors in supplying them with milk. All of these factors need to be considered in studying and appraising the milk-price structure in organized milk markets.

IV. SOME CRITERIA OF WHETHER PRICES ARE PROPER

Some of the factors affecting the price of milk f. o. b. the market have been set forth in the preceding pages. However, the problem of appraising the prices that may be found in any particular market is quite difficult. The factors previously treated in section III of this chapter were those that may not be expected to introduce an arbitrary element in milk prices, unless one takes the view that any organization of supply and methods used in selling milk to distributors is

⁷ The term "requirements" is used here to denote the volume distributors wish to purchase.

arbitrary because of the introduction of the economics of complex, rather than simple, competition into the pricing mechanism. Since the following sections of this chapter will deal with those elements in the situation that may lead to arbitrary pricing in the sense that f. o. b. city prices, especially for milk sold in fluid form, are higher than would otherwise be the case, it is necessary to develop some criteria as to proper prices. One criterion would be that of carefully estimating the so-called competitive price as suggested in section II of this chapter, and comparing such price with the price established in the market. However, competitive prices so computed need further adjustments, as suggested in section III, if account is to be taken of the effect of organization of the supply upon milk prices. Also, the time element is a complicating factor, and although prices may appear arbitrary on the basis of the comparison suggested above for short periods, they may not appear arbitrary when considered in relation to a longer period of time. Fundamentally, although the method suggested above may give valuable results, it appears that perhaps the best criterion as to whether prices are arbitrary is that of whether the producers within the usual supply area are increasing their milk supply, other factors being the same, or whether the milk-supply area is tending to expand, or both, even though the demand for milk is not increasing. Careful analysis, developed along the lines suggested in sections II and III, and in this section, the latter amounting to an analysis of producers' responses to changes in prices, should give some basis for judgment as to whether the price structure established in any particular market is arbitrary, under conditions of complex competition in milk markets, and some measure of the importance of the arbitrary element in the prices established.

Having set forth certain criteria that are rather attenuated in scope, with respect to what prices should be, and having suggested criteria that may be used in the evaluation of the matter of arbitrary prices, or the arbitrary element that may be found in milk prices, attention is now devoted to consideration of the effects of arbitrary pricing, and some of the limitations relative thereto, upon the price structure for milk. Of course, it should be recognized that the criteria one may use in appraising milk prices depend somewhat upon the point of view of the appraiser. If one desires to establish prices that are demonstrably arbitrary, the criteria set forth above have relevancy only when considered in relation to the amount of gain attributable to the arbitrary element in milk prices, and perhaps in the evaluation of the lengths to which arbitrary pricing may be made effective without serious consequences.

V. ARBITRARY MILK PRICES

Arbitrary milk pricing is examined primarily in relationship to its effect on the price of milk f. o. b. city and the farm price structure arising therefrom. The relevancy of arbitrary pricing to the public interest is set forth in chapter 7.

In the first place, are there any bargaining advantages to producers in control of supply? The answer to this question would appear to depend upon the degree of control exercised and the extra costs that would be incurred by distributors if the cooperative withheld its milk from the distributors, so that they had to go outside the usual marketing area and pay prices high enough to attract milk to

the city over the longer distance, and upon other factors. If the bargaining advantages are considered due to the ability to force purchasers to more expensive sources of supply (because of higher transportation costs incurred) then these advantages become calculable in a rough fashion under specific assumptions. Thus, assume that the transportation rate on fluid milk is 0.2 cent per hundredweight per mile, and on the butter equivalent of a hundredweight of milk, 0.005 cent per mile. Assume a market area extending 80 miles from the market, in a circular form, uniform density of production throughout the area, and far enough beyond to yield the same volume as is produced in the area 80 miles from the market, and assume varying degrees of control over the total market supply by the cooperative, as set forth in column 4 of table 32. Assume further that the f. o. b. city price of fluid milk is \$1.956 per hundredweight and the f. o. b. city price of the butter equivalent of milk is \$1.80 per hundredweight.⁸ The cooperative, under the conditions assumed and with complete control, can force distributors to expand the shed 33 miles to secure a volume of milk equal to the volume produced within an 80-mile radius of the market. The maximum increase in f. o. b. prices which might result from this procedure would amount to approximately 6 cents per hundredweight, decreasing to approximately 3.5 cents per hundredweight if the cooperative controls only 50 percent of the milk produced within a radius of 80 miles from the market. (See table 32, fig. 33.)

TABLE 32.—*Hypothetical example of possible bargaining advantage of cooperative through control of supply, with reference to transportation costs*

Market area	Milk sold as fluid milk ¹	Volume controlled by cooperative		Extension of area necessary if cooperative withholds supply ²	Milk price at market center ³	Bargaining advantage ⁴
		Hundred-weight	Percent of total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Miles</i>	<i>Cwt.</i>			<i>Miles</i>	<i>Dol. per cwt.</i>	<i>Ct. per cwt.</i>
80	6,400	6,400	100	33	2.020	6.4
80	6,400	4,800	75	25	2.005	4.9
80	6,400	3,200	50	18	1.991	3.5
80	6,400	1,600	25	9	1.974	1.8

¹ Assuming an average production of 1 hundredweight per 3.1416 square miles.

² Calculated by extracting square root of the sum of the figures in columns (2) and (3), and subtracting the figures in column (1) from the resulting figure.

³ The new price at the city is equal to the new distance times the transportation rate per mile per hundredweight of milk plus the farm price of milk used in butter manufacture at the edge of the new milk zone.

⁴ New price less former price of \$1.956 per hundredweight (see text).

Similarly, if it is assumed that the amount of milk needed to meet the requirements for fluid milk is produced within an area having a radius of 200 miles, the extent to which the cooperative can influence prices by withholding its milk and forcing distributors to extend the milk supply area in order to secure milk is much greater than in the small market area in the example just given. In this second example it is assumed that the f. o. b. market price of the butter equivalent of a hundredweight of milk is \$1.80 per hundredweight, and that the f. o. b. city price of fluid milk would be \$2.190 per hundredweight if transportation costs were 0.2 cent per hundredweight per mile for fluid milk. Under these conditions the possible bargaining advantage

⁸ For convenience in presentation, only fluid milk and butter are considered in the illustration.

of the cooperative ranges from about 16 cents per hundredweight, when the cooperative has complete control, to approximately 9 cents per hundredweight, when it has control of only 50 percent of the milk within a 200-mile radius of the market. (See table 33, fig. 33.) It should be noted that in these examples no effort has been made to work out the equilibrium conditions that would prevail if the cooperative were able to secure the full amount of the estimated bargaining advantage. This would be an extremely difficult matter and would have little relevancy to the problem at hand, which is merely that of demonstrating that the cooperative may be able to secure higher prices than would otherwise be the case because of the possibility that it may be able to force distributors to pay it higher prices or secure their supply from more expensive sources. The examples, while hypothetical, nevertheless serve in a general way to indicate the price-bargaining advantage that may accrue to the cooperative through control of supply.⁹

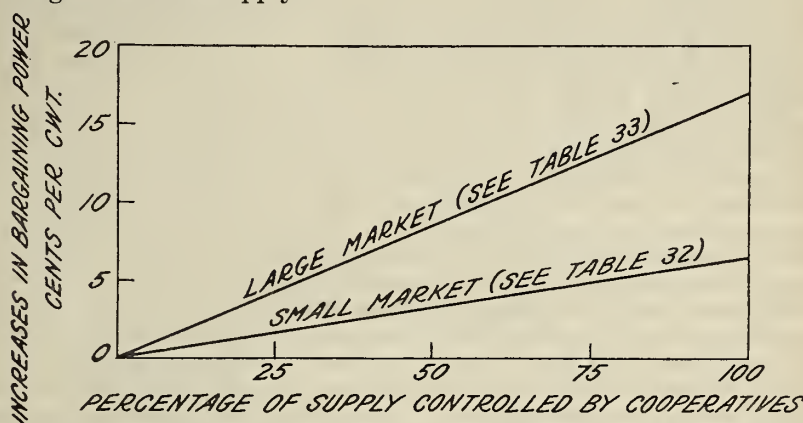


FIGURE 33.—Increase in possible bargaining advantage of the cooperative as the percentage of the total milk supply controlled by the cooperative increases, if distributors are forced to seek sources of supply more expensive in terms of transportation cost.

TABLE 33.—Hypothetical example of possible bargaining advantage of cooperative through control of supply, with reference to transportation costs

Market area	Milk sold as fluid milk ¹	Volume controlled		Extension of area necessary if cooperative withholds supply ²	Milk price at market center ³	Possible bargaining advantage ⁴
		Hundred-weight	Percent of total			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Miles	Cwt.			Miles	Dol. per cwt.	Ct. per cwt.
200	40,000	40,000	100	83	2.352	16.2
200	40,000	30,000	75	65	2.317	12.7
200	40,000	20,000	50	45	2.278	8.8
200	40,000	10,000	25	24	2.237	4.7

¹ Assuming an average production of 1 hundredweight per 3.1416 square miles.

² Extension of area is equal to the square root of the sum of the figures in columns (2) and (3), less the figures in column (1).

³ The new price at the city is equal to the new distance times the transportation rate per mile per hundredweight of milk plus the farm price of milk used in butter manufacture at the edge of the new milk zone.

⁴ New price less former price of \$2.190 per hundredweight. (See text.)

⁹ The examples given also ignore the matter of the seasonal excess. The daily excess is assumed to be taken account of in the matter of f. o. b. city prices established for milk.

The foregoing example takes account only of the bargaining advantage of an organization controlling a part of the supply through forcing distributors to seek sources of supply that are more expensive because of expansion of the area and resultant higher transportation costs. When it is considered that it is usually more expensive to produce milk qualified for distribution as fluid milk, it can readily be seen that the organization may for short periods of time secure larger bargaining advantages than those indicated in the examples given above, since it would probably be necessary to pay somewhat higher prices on a short-time basis to get new producers to meet the sanitation regulations than would be necessary over a period of time, especially if they had little reason to believe they would be able to sell their milk in the fluid-milk outlet for any appreciable period.

However, although the cooperative may have demonstrable advantages in bargaining power, exercise of such power may readily lead to great difficulty. Thus, if the cooperative is successful in bargaining for prices which have a greater or lesser arbitrary element, production responses of two kinds are set in motion, other factors being the same. In the first place, the organization seldom has complete control of the supply of milk readily available to distributors; hence, it would be subject to strong pressure from distributors purchasing all or a part of their supplies from it, since the fact that such distributors would have to pay somewhat higher prices than distributors not purchasing their milk supply from the organization would place the former in a disadvantageous competitive position. Prices of fluid milk being out of line with other dairy product prices, producers outside the regular supply area would tend to seek an outlet in the fluid-milk trade, and distributors would probably be willing to take them on, their willingness depending upon the relative cost of acceding to the demands of the organization for an arbitrary element in its prices and the cost of going outside the usual supply area to secure their milk requirements. The other type of price response to be expected under arbitrary pricing is an increase in production within the usual supply area. It is well recognized that an increase in prices received by producers, other factors being the same, will be associated with an increase in production. Thus the response of producers to changes in price, in this case arbitrary pricing relative to fluid milk, tends to hold in check and perhaps to eliminate the possibilities of arbitrary pricing by the cooperative through control of supply.

The cooperative, in order to secure or maintain bargaining strength, may endeavor to bring its potential competitors outside the regular supply area into the organization, thus buttressing its position in securing higher prices from distributors by making it even more expensive for the distributor to secure his milk supply than would be the case if the cooperative did not extend its membership. Thus, with the same transportation rates as were assumed in the previous example, assume that the cooperative, in order to enhance its bargaining position, takes in members outside the assumed supply area of 200 miles. (See table 34.) As the cooperative extends its membership, dis-

tributors would have to go increasingly longer distances to secure a supply of milk if the cooperative should withhold its supply, and would have to pay increasingly higher prices. Under the conditions assumed in this example the cooperative could enhance the price it receives for milk sold as fluid milk from 16 to 27 cents per hundred-weight over what it could secure otherwise (it being assumed that the price of milk f. o. b. the city would be \$2.19 per hundredweight in the absence of organization of the supply, and that the f. o. b. city price of the butter equivalent of a hundredweight of milk is \$1.80).¹⁰ (See table 34, fig. 33.) However, there would be marked elements of instability present if the cooperative attempted to realize such possible bargaining advantages in class I milk (milk sold to consumers as fluid milk). It has already been shown how the producers would tend to expand production within the usual supply area having a radius of 200 miles if returns to producers were increased by arbitrarily pricing class I milk, and how producers beyond the 200-mile point would tend to seek a fluid milk outlet. When the cooperative endeavors to secure a greater degree of control by bringing producers outside the usual supply area into the organization, thereby forcing distributors to more expensive sources of supply, it enhances its bargaining position on class I milk, but if the milk of all members is pooled the structure tends to break down, because with an increasing surplus as the supply area is extended and prices to consumers rise (which would probably be the case), it becomes advantageous for the cooperative members to withdraw from the association and become producer-distributors or sell their milk to a flat-price buyer. In the example given in table 34, if it is assumed that a weighted average price is paid producers, the weighted average price f. o. b. city would decline as the class I price increased, and regular fluid-milk producers would receive no greater weighted average return if the cooperative extended its control over the area within a 250-mile radius of the market; and as a matter of fact their weighted average return, if control were extended 275 miles, would be reduced 4 cents per hundred-weight from that received before arbitrary pricing was practiced. This difference may be taken as a rough indication of the incentive of nearby producers to go into the milk distribution business and become producer-distributors. It may also be taken as a rough indication of the amount which a distributor with higher than average class I utilization can afford to offer nearby producers on a flat-price basis, encouraging them to break away from the organization by paying somewhat higher average prices to such producers than they would receive if they continued to be members, yet securing their milk at less total cost than if such distributor purchased his milk from the cooperative.¹¹

¹⁰ In setting up these examples no account has been taken of the possibility of a decline in distributors' margins, or, if distributors raise their selling prices, of the decline that would take place in fluid-milk sales.

¹¹ A more detailed description of the factors involved in flat-price buying when most of the market supply is organized and sold to distributors on a classified-price basis is given in ch. 7.

TABLE 34.—*Hypothetical example of possible bargaining advantage on class I milk with extension in cooperative membership beyond the usual supply area, and the approximate effect such extension would have upon weighted average prices f. o. b. the market*

Market area	Milk sold as fluid milk	Volume controlled by cooperative ¹	Extension of market area necessary if co-operative withholds supply ²	Milk price at market center ³	Possible bargaining advantage ⁴	Weighted average price to co-operative member f. o. b. city ⁵	Net gain or loss to regular producers ⁵
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Miles</i>	<i>Cwt.</i>	<i>Cwt.</i>	<i>Miles</i>	<i>Dol. per cwt.</i>	<i>Ct. per cwt.</i>	<i>Dol. per cwt.</i>	<i>Ct. per cwt.</i>
200	40,000	40,000	83	2.35	16	2.35	+16.0
225	40,000	50,625	101	2.39	20	2.27	+8.0
250	40,000	62,500	120	2.42	23	2.19	0.0
275	40,000	75,625	140	2.46	27	2.15	-4.0

¹ Assuming an average production of the original market area of 1 hundredweight per 3.446 square miles.

² Extension of market area is calculated by extracting the square root of the sum of the figures in columns (2) and (3), and subtracting from the resulting figure the figures given in column (1).

³ The new price is equal to the new distance times the transportation per hundredweight of milk plus the farm price of milk at the edge of the new milk zone.

⁴ Weighted average f. o. b. city price without arbitrary pricing=\$2.19 per hundredweight. The figures take no account of changes in demand due to changes in prices, fluid milk sales being assumed constant at 40,000 hundredweight.

⁵ The f. o. b. city price of a hundredweight of milk used in butter manufacture being assumed to be \$1.80.

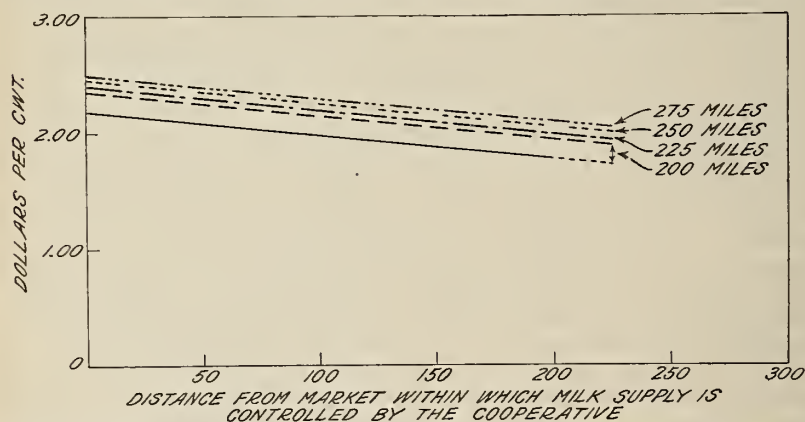


FIGURE 34.—Possible bargaining advantage of the cooperative on fluid milk as it extends its membership beyond the assumed supply area of 200 miles and the milk-price structure arising therefrom, when complete control of supply within the indicated areas is assumed.

Another problem that needs careful consideration in pricing milk arises from the relationship between the prices of milk used for fluid use and that used in other dairy products. It is a difficult matter to decide what prices distributors should be charged for milk used in products other than fluid milk. While it is generally true that such prices must of necessity be set at the competitive level, there are perhaps as many difficulties encountered in pricing such milk on the so-called competitive basis as are encountered when the pricing of fluid milk on a competitive basis is attempted, and any error in the construction of such prices results in arbitrary pricing and the reactions that may be expected to result therefrom are comparable to those

set forth in this connection with respect to fluid milk.¹² One practice that may exist to a greater or lesser degree in milk pricing is that of "trading" for high class I prices on the basis that, if the desired class I price is secured, a low price will be granted on excess milk. It is difficult to tell whether such prices are low, since it is probable that fluid-milk distributors with, say, a butter enterprise are not able to manufacture butter as efficiently as regular butter manufacturers, since in most markets the volume manufactured by milk distributors seasonally will probably vary more markedly than does that of the regular manufacturer. On the other hand, the fluid milk distributor may in some cases be able to differentiate his product on the basis of the quality of milk used in manufacturing his butter, and may be able to secure higher prices, other factors being the same, than the regular butter manufacturer. In any case, if the cooperative sells its excess milk at prices lower than the price indicated on a competitive basis, such procedure, if unduly profitable to distributors, is likely to result in encouraging the production of dairy products in areas which, other factors being the same, tend over a period of time to have a comparative disadvantage in the production of such products.¹³

Another result that may follow in some cases where excess milk is priced lower than it should be and where there are other plants in the area manufacturing dairy products other than the product manufactured by distributors from their excess milk is that distributors may receive such excess milk at their plant and resell it to a manufacturing plant at a profit. It is questionable whether those engaged in selling milk to distributors should make such procedure possible, in bargaining for milk prices, since such profits arise not from plant operation as such but from trading in milk prices. From the standpoint of the organization such procedure may not be inimical to its interests in the short run, since it may be presumed to have gained more than it lost by securing a higher price for class I milk than would have been the case otherwise. However, it is difficult to see how such procedure can be to the interest of producers, distributors, or consumers, over a period of time, since its long-run effect would probably result in inefficiency in the milk trade.

The preceding sections have pointed out some of the major difficulties in pricing milk f. o. b. city with special reference to price levels, leaving out of consideration other problems and factors which it would be desirable to discuss if pricing problems were to be treated in detail. The discussion now progresses to a consideration of factors affecting the number of classes in which milk is priced. Some of the factors discussed in the following sections also affect the level of prices and the price differentials between classes.

VI. FACTORS AFFECTING THE NUMBER OF CLASSES: THE VOLUME OF MILK PRODUCTION WITHIN THE MILKSHED IN RELATION TO SALES

There are wide variations among milk markets in the matter of volume of production of those producers selling milk to city distributors in relation to the volume of sales of such distributors in different forms. In some markets the volume of milk produced within the immediately surrounding territory is not large enough to cover total

¹² See sec. II of this chapter.

¹³ This does not necessarily apply to milk markets located in "surplus" production areas.

sales of fluid milk and cream to consumers. These areas may be called deficit areas, in the sense that a large portion of the dairy products consumed in the market is produced in areas far removed from the market.¹⁴ On the other hand, the volume of milk produced within the area supplying fluid milk to many markets is far in excess of the volume of fluid milk and cream sold to consumers in such markets. Milwaukee, Wis., is an example of the latter type, and the areas supplying milk to such markets may be termed surplus areas.

If the volume of milk produced within the supply area of a given market is barely sufficient to cover fluid-milk and cream sales, there would appear to be little reason to establish more than two classes, since no milk is available for sale in other forms. However, if distributors receive a larger volume of milk and cream from producers than can be sold to consumers as milk and cream, more than two classes may be established, depending upon the size of the surplus and certain other factors that will be treated below.

VII. FACTORS AFFECTING THE NUMBER OF CLASSES: THE INFLUENCE OF SANITATION REGULATIONS

The cleanliness of milk consumed as fluid milk and cream has attracted considerable attention for a long period of years. This has led to the gradual development of sanitation regulations applicable to milk produced for these uses. At the present time many cities have regulations specifying the minimum chemical requirements which milk must meet in order to be sold to consumers as fluid milk, as well as the maximum bacteria count allowable for such milk. In addition, the regulations in many milk markets specify the type of barn, flooring, milk-house construction, and manner in which manure shall be disposed of; prohibit the sale of milk from herds not tuberculosis accredited; set forth the temperature to which milk must be cooled after being drawn, etc. The sanitation regulations applicable to milk produced for use as fluid milk and cream are, generally speaking, much more stringent than those applicable to milk produced for use in manufactured dairy products. Thus, if the desired volume of milk for city distribution is to be forthcoming, the price received by producers must, over a period of time, be sufficient to cover the additional cost of producing such milk over the cost of producing milk for use in manufactured dairy products, other cost factors being the same.¹⁵

The applicability of sanitation regulations to various products is a matter of considerable importance in affecting the number of classes and the uses of milk that will be placed in different classes. In some cases the sanitation regulations are the same for milk produced for use as fluid milk as for that produced for use as fluid cream. In this case, sanitation regulations do not operate to establish different supply prices for the milk produced for use in these products, other cost factors being the same, nor do they operate to establish different f. o. b. city prices for these products (differences in transportation costs per unit of milk and the product equivalent of such milk may so operate, however). In other cases, sanitation regulations are stringent for milk produced for use as fluid milk, less stringent for milk produced for use as fluid cream, and still less stringent for milk produced for

¹⁴ Boston, Mass., is an example of this type of market. In 1934 cream was shipped to Boston from 14 States.

¹⁵ See ch. 4, sec. I, for a more detailed discussion of this matter.

use in manufactured dairy products. In this case there would tend to be different supply prices for milk produced for different uses, and there would tend to be different prices for such products f. o. b. the market center, exclusive of differences in transportation costs and other factors.

In bargaining for prices with distributors, cooperatives undoubtedly consider sanitation regulations in determining the number of classes in which the milk of their members will be sold. Generally speaking, and assuming no element of commodity price discrimination, differences in transportation costs, etc., it would appear that the number of classes and the price differentials between classes established would be directly associated with the differences in the stringency of the sanitation regulations applicable to the various products, account being taken, of course, of the volume of milk produced in excess of the volume sold as fluid milk by distributors.

VIII. FACTORS AFFECTING THE NUMBER OF CLASSES: THE INFLUENCE OF DIFFERENCES IN TRANSPORTATION COSTS PER UNIT OF MILK AND THE PRODUCT EQUIVALENT OF SUCH UNIT

The effect upon the milk-price structure of differences in the cost of transporting a unit of milk in fluid form to the market center and the product equivalent of such unit of milk has been set forth in chapter 4, section II, wherein it was shown that, in a market in which it is necessary to reach out some distance to obtain a supply of fluid milk for the market and in which the processing of dairy products tends to be decentralized, the supply area tends to be zoned, with the bulkier, less readily transportable milk products being produced in the inner zones and the products of lesser bulk which incur relatively lower transportation costs being produced in the outer zones. In bargaining with distributors, cooperatives recognize the importance of this factor, and, if different types of manufactured dairy products are produced within the area wherein their members are located, the number of classes established by the cooperative will tend to be associated with the number of zones in the shed, the availability of different manufactured-product outlets, and the size of the surplus of production in the shed over fluid sales by distributors.

IX. FACTORS AFFECTING THE NUMBER OF CLASSES: COMMODITY PRICE DISCRIMINATION

It is rather well recognized that a person or firm having a considerable degree of control over the supply of a particular commodity may find it advantageous to sell such commodity in different markets at prices marked by differences other than those attributable to such factors as differences in transportation costs, etc. This practice is commonly called price discrimination.¹⁶ The degree to which it is feasible to practice price discrimination depends mainly upon the elasticities of demand in the various markets available to the seller, and upon the strength of the monopoly elements in those markets.¹⁷ Price discrimination has usually been considered from the point of view of a seller selling one commodity, and perhaps this is just as well

¹⁶ Robinson, Joan, *Economics of Imperfect Competition*, ch. XV.

¹⁷ See ch. 4. In that chapter it was shown that, when sellers operating under conditions of complex competition have available a market wherein they are operating under conditions of simple competition, prices in the former will be indeterminate between a price perhaps higher than the monopoly price in such market, and the competitive price in the alternative market, depending upon the strength of the monopoly elements.

in general theoretical works and may suffice when such theory is applied to an examination of the price structure of an industry wherein the production units are engaged mainly in the production of one commodity. On the other hand, it should be recognized that many industries produce more than one commodity from a given raw material. The elasticities of demand for the various products may be considerably different, in which case the manufacturer of the finished products has a difficult problem in determining what allocation he will make of the raw material between enterprises. As far as the milk distributor was concerned, it was shown in chapter 4 that he would allocate the supply of raw material among his various sales outlets, fluid milk, fluid cream, and the like, in such fashion as to maximize his profits, or minimize his losses. It was shown that this purpose would be achieved when marginal revenue less marginal costs in one enterprise equaled marginal revenue less marginal costs in the other enterprise (or enterprises, if more than two enterprises were followed). Also, it was shown that distributors have, by and large, tended to hold their retail prices and (except for seasonal changes in demand) their fluid-milk sales constant throughout the year, and have practiced interenterprise diversion on a seasonal basis, shifting the seasonal excess to products with a less inelastic demand or with respect to which they operate under conditions of simple competition.

The cooperative association, in deciding in what form to sell its milk, has practically the same type of problem as has the distributor in deciding upon the forms in which he will sell the milk he purchases. Having control of a considerable portion of the total available market supply of the raw material, the cooperative can increase the returns it secures for members by diverting supplies from those products having an inelastic demand to those having an elastic demand, even though ordinarily no milk would be produced for use as manufacturing milk in the area supplying fluid milk to the market (leaving aside the question of the seasonal and daily excess, which can hardly be considered as being produced for use in manufacturing dairy products, even though so utilized). How this may be accomplished is shown in figure 35, where *ss* represents the series of prices at which different volumes of milk will be supplied by producers; *ar* the average revenue curve, i. e., the demand curve for the milk of the cooperative; *mr* the marginal revenue curve for such milk; and *pk* the price which the cooperative can secure for milk sold as butter, with respect to which the cooperative is assumed to be operating under conditions of simple competition.¹⁸ If the milk supply were being sold under conditions of simple competition, the annual equilibrium price would be *oz'*; and *ov* would be the volume associated with such equilibrium price. No milk would be diverted from the fluid-milk market to the butter market, except for the daily and seasonal excess which does not affect the theory at this point. If, however, a cooperative were established and secured a considerable degree of control over the total market supply, it would be profitable, at least in the short run, to divert milk from the fluid market to the butter market. It would be profitable for the cooperative to start diverting milk from the fluid-milk market at *t*, the point of intersection of *mr* and *pk*, selling the volume *ov'* to fluid-milk distributors at the average price *ob'*, and the volume *v'v* for manufacture

¹⁸ It is highly probable that this would be the case, on account of the insignificant portion of the total butter supply represented by the volume of milk handled by the cooperative.

into butter. Excess returns of $z'n m n'$ would be secured with respect to the volume ov , the output of fluid milk would be less than under simple competitive conditions by the amount $v'v$, and fluid-milk prices would be higher than under conditions of simple competition (other factors the same) by the amount $b'z'$. However, it would be profitable for producers to increase their output to v'' , where the combined average revenue curve for both milk and butter, $a'r'$, crosses ss . This type of operation, where the cooperative, having a high degree of control of the supply of raw material, diverts milk from the more inelastic uses to less inelastic uses, will be called commodity price discrimination¹⁹ to distinguish this type of operation from that of the seller of one commodity who establishes different prices in different

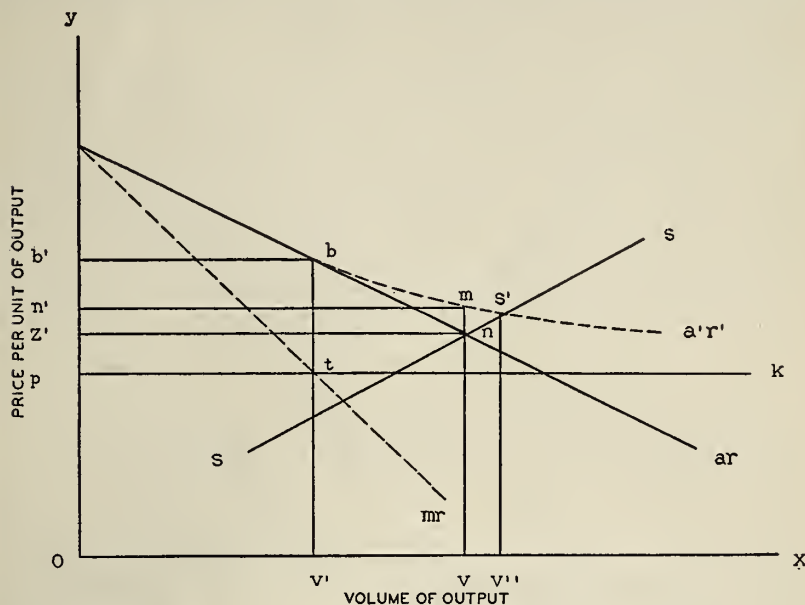


FIGURE 35.—Prices and output in two enterprises under conditions of commodity price discrimination.

markets (other than costs of transportation and other factors), which is commonly called price discrimination.

The extent to which commodity price discrimination will be practiced will depend in large part upon: (1) The extent to which the total market supply is controlled by the cooperative; and (2) the availability of alternative product markets, which products have a less inelastic demand curve than fluid milk, or with respect to which the seller is operating under conditions of simple competition.

The extent to which the total market supply is controlled by the cooperative is a factor of major importance in determining whether it would be feasible to practice commodity price discrimination in any particular market. It has been shown that the demand for milk is

¹⁹ Cassels' term for this type of price discrimination is "discriminative marketing." His development of this point is decidedly similar to that given above. See Cassels, J. M., and Sorenson, Helen, *The English Milk Market*, *Quarterly Journal of Economics*, February 1936, pp. 275-296.

much more inelastic than the demand for other dairy products, especially for those manufactured dairy products with respect to which the output of the cooperative is an insignificant portion of the total production of the country. Thus the greater the degree to which the cooperative controls the total supply of milk available in the market, the closer the demand curve for the milk sold by the cooperative will approach that of the market as a whole. Similarly, the demand curve for the milk sold through the cooperative will become more and more elastic as the proportion of the total supply controlled by the cooperative declines. Hence under complete control the extent to which commodity price discrimination is practiced will probably be found to be greater than when a smaller degree of control is exercised. With a small degree of control the cooperative would merely deprive member producers of their market if it insisted upon arbitrary prices for that portion of their milk sold as fluid milk.

In addition to the foregoing, the extent to which commodity price discrimination may be practiced will depend upon the volume of member production in relation to the volume of fluid milk sales of distributors purchasing their supplies from the cooperative association, and upon the availability of manufacturing facilities for manufactured dairy products. Although the production of manufactured dairy products tends to be highly concentrated geographically it will often be found, in areas supplying milk to fluid milk markets, that facilities are available for manufacturing several manufactured dairy products, such as evaporated milk and cheese. Ordinarily, processors of evaporated milk will pay more for milk than butter manufacturers will pay for the butterfat equivalent of milk, since the farmer delivering cream to a butter plant will have some use for the skim milk on his farm while the producer delivering milk to an evaporated milk plant probably has to be recompensed for foregoing the farm use of skim milk in such enterprises as raising hogs and poultry. The same argument suffices to explain why butter manufacturers who manufacture skim-milk products in conjunction with the butter enterprise will generally be found to be paying more for milk than butter manufacturers, who have no skim-milk byproduct enterprises, pay producers for the butterfat equivalent of milk.

Thus the more product markets there are available, with different prices for milk sold in such product markets, the greater will be the tendency toward a higher degree of commodity price discrimination, the price for fluid milk and fluid cream will tend to be higher, and the volume smaller, than would be the case if the butter market were the only alternative market. This can be demonstrated in a general way by raising the line pk in figure 35 so that pk cuts mr at a higher level than that shown, making it more profitable to sell less milk as fluid milk at average prices higher than the price indicated in the figure.

X. FACTORS AFFECTING THE SIZE OF THE PRICE DIFFERENTIAL BETWEEN CLASSES

Several of the factors that influence the number of classes which will tend to be established in any particular market also affect the size of the price differentials that will tend to be established between classes.

The influence of differences in the cost of transporting milk, cream, butter, etc., upon the price structure for milk was treated in chapter 4,

section I. The differentials between the class prices established for class I milk (the common term for milk sold by distributors as fluid milk) and other classes will ordinarily be larger in a market where it is necessary to reach out farther from the market to secure the desired supply than in a market located in a dense production area where the milk supply can be secured from a shorter distance from the market, other factors being the same. The same reasoning applies to the size of the differential between milk used for cream and that used for other, less bulky and less perishable, products.

The treatment of the influence of sanitation regulations upon the price structure for milk, given in chapter 4, serves to indicate in a general way the manner in which differences in the sanitation regulations applicable to milk produced for use as fluid milk and milk produced for use in other dairy products affect the differentials between the various classes of milk. The more stringent the regulations applicable to milk produced for use as fluid milk as compared to milk produced for use in other dairy products, the higher will the differentials between the different classes tend to be, decreasing in size as the stringency of the regulations decreases from class to class.

Insofar as commodity price discrimination is concerned, the higher the degree of such discrimination the stronger will be the tendency for a wide spread between the product or products with reference to which the association is operating under conditions of complex competition and the product with reference to which it is operating under conditions of simple competition.

XI. SUMMARY

Two major types of problems arise in pricing milk to distributors in fluid-milk markets: (1) Those concerning the general level at which prices could or should be established, and (2) those concerning the number of classes that should be set up and the size of the price differential between classes.

Once the economic setting becomes one wherein classified pricing tends to develop, and once it is decided that milk is to be sold to distributors on the basis of a classified-price plan, such factors as the volume of milk controlled by the cooperative in comparison with the volume of sales of distributors, the types of outlets for surplus milk, the differences in the stringency of sanitation regulations as regards milk produced for fluid milk and milk produced for use in other dairy products, and the degree to which commodity price discrimination may be carried, all have some influence upon and should be considered in analyzing classified-price plans in the markets. Such factors also have some influence in determining the size of the price differential between classes. These factors will have varying importance in various markets, depending upon market circumstances. In markets that draw their supplies from more distant sources, the spread between the price of milk produced for fluid use and that of milk produced for use in other dairy products, f. o. b. the market, will tend to be wider than in markets securing their supply from nearby sources. Similarly, other factors being the same, the price differential will tend to be larger in markets having stringent sanitation regulations than in markets having less stringent regulations. In a market where a large surplus above fluid sales is produced, and where several dairy products are

manufactured, there will tend to be a larger number of classes than in a market where volume of production is about the same as volume of fluid sales. Also, in markets where commodity price discrimination can be practiced, there will tend to be either a larger number of classes or a higher spread between milk sold as fluid milk and milk sold in the form of other dairy products, or both, than in markets where conditions are not conducive to, or where the persons operating the selling plan do not wish to practice, commodity price discrimination.

Finally, appraisal of the price structure that may be found in any particular market is quite difficult. Some of the activities of cooperatives are conducive to lower supply prices of milk, other factors being the same, while some of their activities may result in a greater or lesser degree of arbitrary pricing. In any case, an understanding and appraisal of the price structure that will be found in any particular market can be obtained only from an analysis of conditions affecting the market.

The analysis thus far has pertained primarily to prices charged distributors. The next chapter will deal with the determination of prices paid to producers.

CHAPTER 6

SOME PROBLEMS IN POOLING MILK

I. INTRODUCTORY

The problems encountered in pooling milk, the term being used in this chapter synonymously with prorating among producers the proceeds of sales to distributors, are difficult of analysis for several reasons. Data are not available to determine what the course of prices would be in any particular market, especially on a seasonal basis, without large-scale organization of the supply.²⁰ If distributors contract and expand their supply area inversely to the seasonal variation in production, certain results are obtained.²¹ If, on the other hand, distributors set up a particular supply area which in the season of low production is just sufficient to cover their fluid-milk needs, the seasonal variation in prices paid producers may be somewhat different and perhaps less marked than in the former case. In addition, if there is significance in the contention that distributors, by and large, have at times been able to out-bargain producers and thereby keep prices to producers lower than would have been the case otherwise, the difficulties in determining what would have been the relationships between prices received by different producers on a seasonal basis, become even more marked because of arbitrary elements in the data that may be available.

In spite of these difficulties, it is possible to secure some idea of what prices would be in the absence of large-scale organization of the supply. It has been pointed out in chapter 4 that, in the absence of large-scale organization of supply, it is probable that there would be marked seasonal variation in prices received by producers, that is, in the general level of prices received by producers from season to season during the year, especially in those areas having a marked seasonal variation in production.

In discussing the effects of seasonal variation in production upon price, Cohen points out that, "In markets where milk is at all times available in excess of the requirements for fluid milk and cream, the price of milk should equal at all times the value of milk converted into manufactured products, plus any extra costs to the farmer of producing milk in good enough sanitary condition to sell in liquid form, and of bringing the liquid milk to market." Also, "In an area where such a surplus only exists at some part of the year, price should equal surplus prices at such a time to outlying farmers, but should rise in the short season to a height sufficient to stimulate the required volume of production at that season."²²

²⁰ See ch. 2, sec. III, for a discussion of the origin and development of formal pooling in the milk trade.

²¹ See ch. 4.

²² Cohen, Ruth L., *A Survey of Milk Marketing Schemes and Price Policies*, University of Cambridge, Department of Agriculture, Farm Economics Branch, Report No. 20, p. 13.

Under conditions of simple competition and with a given seasonal variation in prices received by producers in any particular market, producers differing with respect to their seasonal variation in production will receive different average annual prices, other factors being the same. Some producers may show a seasonal variation in production that is inverse to that obtaining for the market supply area as a whole; others may produce a fairly constant volume of milk throughout the year; and others whose production comprises the greater portion of the volume produced in the supply area may show a seasonal variation in production approximately the same as the seasonal variation in the total volume produced within the entire supply area. Other factors being the same, the first type of producer will receive the highest average annual price for his milk, because he will sell a relatively larger portion of his annual output during the period of the year when prices are seasonally highest, and the second type will secure somewhat lower average annual prices than the first type but higher than the third type. In addition, the producer who produces a volume having a seasonal variation closely approaching the seasonal requirements of the fluid milk trade may secure somewhat higher prices than those indicated on the basis of his seasonality in production and the seasonal variation in market prices, a price perhaps in the nature of a premium, if distributors are trying to encourage seasonal uniformity in production.²³ These are the relationships between the average annual prices received by producers that should be expected to prevail under conditions of simple competition, factors other than their seasonal variations in production—such as quality and location—being the same. The extent of the variation in the average annual prices received by individual producers would depend upon the seasonal variation in prices received by producers generally, upon the relationship between the seasonal variation in production of individual producers and that of the entire volume produced within the entire supply area, and upon any premiums for evenness in production that distributors might pay.

In the remainder of this chapter pooling devices will be examined from the viewpoint of their relevancy to the relationships between the prices that different producers would receive without formal pooling, or without organization of supply. The problem is closely related to the manner in which class prices are established and the method of prorating among producers the proceeds of sales to distributors. The former is important because it may result in a change in the level of prices on an annual basis, at least for short periods of time, and may result in changes in the seasonal variation in prices for the market as a whole, with resultant changes in the relationships between prices received by different producers. The latter is significant because of the possibility that certain pooling devices may operate so that the relationships that existed between the prices received by different producers prior to formal pooling may either be maintained or disrupted, with resultant effects upon the output of different producers and different areas within the supply area.

In dealing with the problem, three important things should be noted: (1) The seasonal course of prices without formal class pricing and formal pooling, (2) the effect of the classified-price plan upon the seasonal variation in market prices, and (3) the type of pool plan that

²³ See ch. 4.

is used in pricing milk to producers. A major difficulty in the analysis is that arising from arbitrary elements in pricing, either seasonal or annual, or both.²⁴

II. THE INFLUENCE OF SEASONAL VARIATION IN CLASS PRICES UPON THE SEASONAL VARIATION IN PRICES F. O. B. THE MARKET AND IN PRICES RECEIVED BY INDIVIDUAL PRODUCERS

In this section attention is focussed primarily upon the seasonal course of class I prices (usually defined as milk sold for consumption in fluid form). In general, class I prices are usually stated in terms of a hundredweight of milk or per pound of butterfat, while prices for milk other than class I are usually stated in terms of a formula, i. e., they are based upon butter prices or the price of milk used in other manufactured dairy products. From this it follows that the price of milk other than class I, and class II (cream) in some cases, varies directly with the price of the manufactured dairy product that is used as the base in the formula. Class I prices, being unrelated to the price of butter or other manufactured dairy products as far as the formal mechanics of prices are concerned, do not necessarily vary as the prices of the other products vary.²⁵ They may do so, but the extent depends upon the pricing procedure followed. The point is of primary importance in connection with the seasonal course of class I prices, since available evidence indicates that, by and large, changes in the annual average prices of class I milk tend to be directly associated with the average annual price of butterfat, butter, and other dairy products.

Available evidence seems to indicate that there is a tendency for class I prices to remain relatively constant throughout the year. The price for other classes of milk, based upon the price of butter and other manufactured dairy products, varies directly with the price of these products. On the basis of the butter prices prevailing from 1921 to 1930, the range between the month of lowest prices, June, to the month of highest prices, December, was a little over 17 percent of the average. Class I milk usually constitutes the greater portion of the milk sold in a market, except in some areas where production is heavy relative to urban population and consumption; and without organization of the supply and the establishment of relatively constant class I prices on a seasonal basis, there would tend to be a rather marked seasonal variation in the price of all milk f. o. b. city,²⁶ depending, of course, upon the seasonal variation in supply and demand. Under conditions of organized supply and the establishment of class I prices that remain relatively constant on a seasonal basis, the seasonal variation in the price received by producers for all milk tends to be less than would be the case if the price for class I milk were not held relatively constant, and prices were allowed to vary considerably, as would be the case in the absence of the two factors treated above. In the latter case the price producers would receive for all milk would

²⁴ Arbitrary in the sense that the seasonal and annual course of prices charged distributors may be different from that which would otherwise be the case, and, unless offset by some pooling device, may be different from the standpoint of prices that would be received by different producers. This is not to say that arbitrary pricing in this sense may not be associated with a marketing plan designed to secure more efficient marketing; hence, one should not jump to the conclusion that arbitrary pricing is necessarily inimical to the public interest. (See ch. 7.)

²⁵ This is not to say that the prices of milk used in butter, evaporated milk, or cheese production are not taken into account in determining class I prices. All that is meant is that class I prices usually are not stated or determined on the basis of the prices for milk used in manufactured dairy products.

²⁶ See ch. 4 for a more complete development of this point.

tend to vary from a level equal to or slightly above manufacturing milk prices during the flush season, to a level materially above manufacturing milk prices during the season of low production. It appears, therefore, that the maintenance of class I prices at a relatively constant level throughout the year probably tends to raise average prices received by producers during the season of high production in comparison with such prices in the season of short production. It is of importance to note in this connection that the classified price plan of selling milk does not necessarily have this result. The important factor is the maintenance of class I prices at a relatively uniform level throughout the year. Cohen found that class prices have been established in such fashion in the New York, Boston, and Philadelphia markets that the seasonal variation in the average price received by producers for all milk had shown a tendency to decline in comparison with that obtaining prior to the institution of a formal classified-price plan. She arrived at this conclusion by comparing the seasonal variation in the net prices received by producers before and after the institution of the classified-price plan, using prices in those periods when there were no major movements in the trend of prices in computing the indices of seasonal variation.²⁷ Another factor that may have been of significance in this connection is that there appears to have been a decrease in the seasonal variation in butter prices during the period covered by Cohen's study.²⁸

The relevancy of the point set forth above in the matter of pooling becomes apparent when considered in relation to differences in the seasonal variation in production of individual producers. As was noted previously, under conditions of simple competition and with a given seasonal variation in production in the market, producers having different seasonal variations in production will receive different average annual prices, the highest prices being received by those whose output shows a seasonal variation in production inverse to that for the entire supply area, the producers whose output is seasonally constant receiving the next highest prices, and those producers whose seasonal variation in production is the same as, or more marked than, that for the market as a whole receiving the lowest prices, other factors being the same.²⁹ Whether the same relationships between average annual prices received by producers having different seasonal variations in production will be maintained when there is large-scale organization of the supply for the purpose, among others, of sale of milk to distributors, will depend (1) upon whether the general level of average annual prices and the seasonal course of prices received by producers for all milk is changed and (2) upon the type of pooling device employed, i. e., the method of prorating among producers the proceeds of sales to distributors. The following sections present an analysis of various pooling devices.

²⁷ Cohen, Ruth L. *op. cit.*, p. 28.

²⁸ The Dairy Situation, Bureau of Agricultural Economics, February 1937.

²⁹ Sec ch. 3, sec. II, for facts and information relative to seasonal variation in milk production in selected areas.

III. SOME EFFECTS OF THE INDIVIDUAL-DISTRIBUTOR POOL UPON PRICES RECEIVED BY PRODUCERS

As was pointed out in section III of chapter 2, in markets operating under the individual-distributor pool, without rating, all producers receive a uniform weighted average price, subject to transportation and other allowances, based upon the utilization of the individual distributor to whom the producer delivers his milk. The figures shown in table 11, chapter 3, section II, indicate that it is reasonable to expect that the proportion of milk used by different distributors in different classes will vary markedly; hence, if the proceeds of sales are prorated among producers through an individual-distributor pool, it follows that producers delivering milk to individual distributors receive various prices, depending upon the differences in utilization of milk by such distributors, other factors being the same. An example of the way this type of pool works is furnished by an analysis of data in the files of the Dairy Section, Agricultural Adjustment Administration, pertaining to sales of milk in the St. Louis marketing area. The marketing plan in effect in the St. Louis marketing area provides, among other things, for the classification of milk according to use, specifies the minimum prices which distributors are required to pay for milk, by classes, and provides for prorating among producers the proceeds of sales to distributors by use of an individual-distributor pool. The figures given in table 35 show the variation in f. o. b. city prices paid producers by individual distributors in May 1934. Average prices ranged from \$1.14 per hundredweight to \$1.70 per hundredweight, with 87.7 percent of the total volume falling within a range of from \$1.20 to \$1.39 per hundredweight. The relationship between the utilization of distributors (all pasteurizing distributors) and weighted average prices to producers f. o. b. city in May 1934 is shown in table 36. Figure 36 shows the relationship between the proportion of total milk sales sold by distributors as fluid milk and weighted average prices to producers f. o. b. city. The scatter around the line of average relationship is due to varying proportions of milk sold as class II milk by different distributors.

TABLE 35.—*Proportion of total milk sold in the St. Louis milk market for which producers received specified weighted average prices f. o. b. city, May 1934*

Weighted average	Total sales	Percent of total	Weighted average	Total sales	Percent of total
	<i>Pounds</i>			<i>Pounds</i>	
\$1.10-\$1.19.....	2, 180, 750	4.3	\$1.60-\$1.69.....	614, 925	1.2
\$1.20-\$1.29.....	20, 182, 555	39.4	\$1.70-\$1.79.....	79, 663	.2
\$1.30-\$1.39.....	24, 742, 434	48.3			
\$1.40-\$1.49.....	3, 127, 342	6.1	Grand total.....	51, 200, 754	100.0
\$1.50-\$1.59.....	273, 085	.5			

Compiled from unpublished data in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

TABLE 36.—*Proportion of total sales of individual distributors sold in different classes and weighted average prices paid producers f. o. b. city, May 1934*

Distributor no.	Proportion of total sales of individual distributors sold in the different classes			Weighted average price f. o. b. city	Distributor no.	Proportion of total sales of individual distributors sold in the different classes			Weighted average price f. o. b. city
	Class I	Class II	Class III			Class I	Class II	Class III	
	Pct.	Pct.	Pct.	Dol. per cwt.		Pct.	Pct.	Pct.	Dol. per cwt.
1-----	19.0	14.6	76.4	1.144	34-----	46.7	8.7	44.6	1.404
2-----	19.2	6.0	74.8	1.150	35-----	47.9	9.6	42.5	1.417
3-----	18.5	9.7	71.8	1.156	36-----	50.6	6.7	42.7	1.432
4-----	26.9	-----	73.1	1.199	37-----	50.6	7.2	42.2	1.434
5-----	29.9	9.1	61.0	1.255	38-----	46.6	19.0	34.4	1.435
6-----	30.3	10.6	59.1	1.264	39-----	53.6	-----	46.4	1.437
7-----	29.8	12.7	57.5	1.266	40-----	47.7	16.7	35.6	1.438
8-----	32.5	8.1	59.4	1.275	41-----	50.0	12.0	38.0	1.440
9-----	33.9	4.4	61.7	1.276	42-----	41.1	37.3	21.6	1.445
10-----	30.4	16.0	54.0	1.278	43-----	51.4	10.8	37.8	1.451
11-----	37.3	3.8	58.9	1.304	44-----	50.5	13.2	36.3	1.452
12-----	36.5	7.5	56.0	1.308	45-----	51.0	13.1	35.9	1.456
13-----	36.8	8.0	55.2	1.313	46-----	55.2	3.1	41.7	1.461
14-----	35.4	14.4	50.2	1.321	47-----	53.7	9.7	36.6	1.469
15-----	37.8	8.4	53.8	1.323	48-----	56.1	3.4	39.9	1.476
16-----	31.7	25.7	42.6	1.325	49-----	55.6	8.7	35.7	1.482
17-----	39.2	7.2	53.6	1.332	50-----	57.7	6.4	35.9	1.494
18-----	40.2	5.6	54.2	1.336	51-----	58.0	10.2	31.8	1.510
19-----	36.7	17.2	46.1	1.342	52-----	62.0	-----	38.0	1.512
20-----	41.7	3.9	54.4	1.343	53-----	57.6	13.7	28.7	1.516
21-----	39.4	10.5	50.1	1.344	54-----	59.4	8.4	32.2	1.516
22-----	35.7	22.6	41.7	1.350	55-----	60.2	8.2	31.6	1.522
23-----	43.4	3.0	53.6	1.356	56-----	61.8	4.2	34.0	1.524
24-----	39.8	14.2	46.0	1.359	57-----	57.0	19.5	23.5	1.530
25-----	44.0	5.3	50.7	1.368	58-----	56.3	26.9	16.8	1.547
26-----	34.9	31.4	33.7	1.371	59-----	65.3	3.6	31.1	1.553
27-----	42.4	10.9	46.7	1.372	60-----	67.4	11.8	30.8	1.598
28-----	46.3	-----	53.7	1.372	61-----	69.9	9.0	21.1	1.611
29-----	41.3	14.5	44.2	1.374	62-----	71.2	8.8	20.0	1.622
30-----	46.4	5.9	47.7	1.392	63-----	69.2	22.2	8.6	1.647
31-----	44.5	11.5	44.0	1.393	64-----	77.8	-----	22.2	1.652
32-----	45.4	8.9	45.6	1.393	65-----	76.5	11.6	11.9	1.678
33-----	42.9	17.7	39.4	1.398	66-----	82.4	1.4	16.2	1.698

Compiled from unpublished data in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

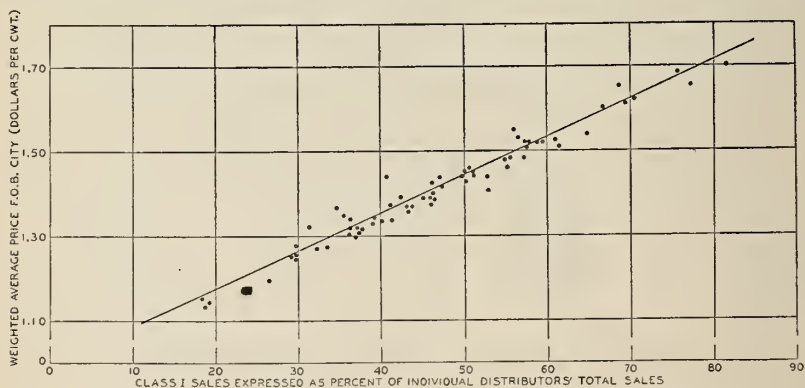


FIGURE 36.—Relationship between proportion of total milk sales sold as fluid milk by distributors and weighted average prices to producers, f. o. b. city, St. Louis, Mo., May 1934.

The foregoing figures indicate the differences arising from the use of an individual-handler pool as far as prices to producers are concerned. The question now arises as to whether the producers, who in the absence of organization of the supply would tend to receive higher prices, receive such higher prices under an individual-distributor pool. As was stated in chapter 4, in the absence of organization of supply relatively more even producers will tend to become associated with specialized fluid-milk distributors and will tend to receive higher prices than uneven producers, other factors being the same. If this is the case the individual-distributor type of pool may result in the proration of returns among producers in such fashion that even producers tend to receive higher average annual returns than uneven producers, although this is offset to some extent by the probability that there are wide differences in the seasonal variation in production between producers comprising the relatively more even group.

A rough indication as to whether there is a tendency for even producers to become associated with specialized fluid-milk distributors is secured by an analysis of the relationship between evenness of milk receipts, measured by the range between the month of low receipts and the month of high receipts expressed as a percentage of average receipts for the year, and the proportion of total sales represented by class I sales, that is, sales of fluid milk by each distributor.³⁰ The relationship between these two factors is set forth in figure 37. The figures used relate to 11 distributors in St. Louis comprising about 82 percent of the market, indicated in the diagram by crosses, and 22 distributors in Boston, comprising all but a very minor percentage of the market, indicated in the diagram by dots. While not all the sales of all of the distributors in St. Louis were analyzed in this connection, the records of the remaining distributors show more variation than any but one of the distributors for which figures are plotted in figure 37.

In the St. Louis market there does not appear to be a very close relationship between specialization, measured by the proportion of total sales represented by sales of fluid milk, and the seasonal variation in total sales, used as a measure of seasonal variation in receipts of milk from producers. There are perhaps several reasons for this. In the first place, St. Louis is situated in a rather dense production area, and many of the larger distributors operate a sizeable manufacturing enterprise. In the second place, sanitation regulations have not been very stringent in the past; hence, with considerable milk in the area that could be picked up rather easily as circumstances warranted, there probably has been less incentive for distributors to use as much discrimination in securing their milk supply.

In the case of the Boston milk market, however, it appears that there is a definite tendency for specialized fluid-milk distributors to have a more even supply of milk than less specialized distributors. (Note the dots in fig. 37.) Although the relationship is not at all precise, nevertheless a definite relationship appears to exist. As the proportion of total sales represented by sales of fluid milk (class I) increases, the seasonal variation in total sales tends to decrease. It should be noted that the specialized fluid-milk distributors handle only a small proportion of the total fluid-milk sales. The distributors

³⁰ There is some degree of error in this calculation. Receipts, equal in this case to total sales, include interdistributor sales; hence, they are not an absolutely accurate measure of receipts from producers. However, interdistributor sales are probably not significant in relation to total sales in the market.

who have a large portion of the total volume of fluid-milk business in the market do not show as little seasonal variation in total sales as some of the smaller distributors. However, the larger distributors either have country stations or receive their supplies largely through country stations operated or controlled by the cooperative. Some of these stations ship fluid milk all of the time, others intermittently or

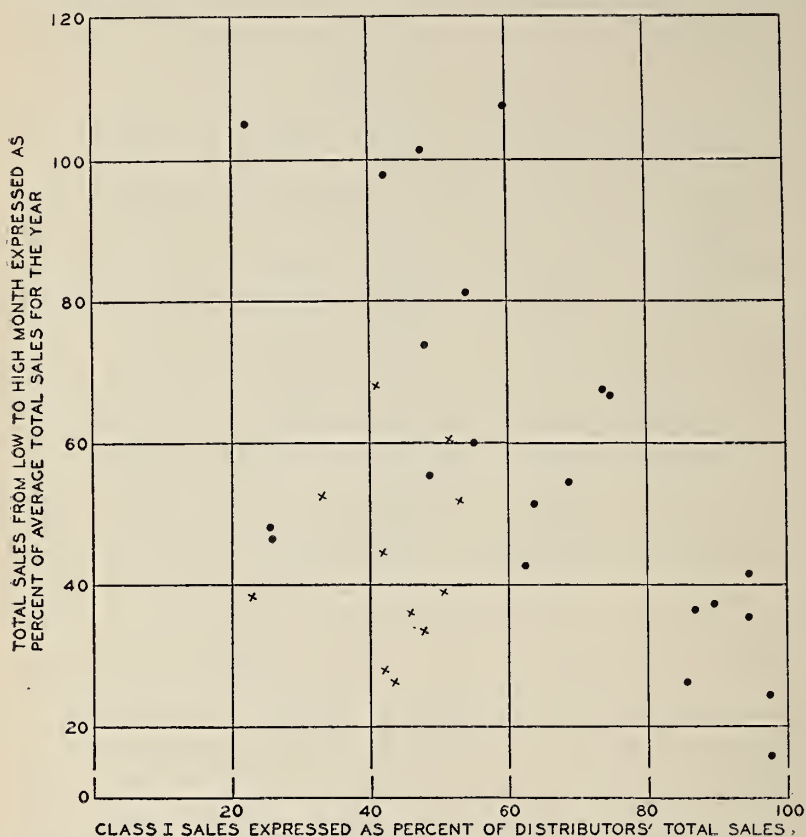


FIGURE 37.—Relationship between the proportion of total sales sold as fluid milk, and range in total sales from the low month to the high month, expressed as a percentage of average total sales for the year, by St. Louis Mo., (July 1934-June 1935) and Boston, Mass., (Mar. 16, 1934-Dec. 31, 1934) distributors.

not at all, the milk being converted into cream in these latter stations and shipped to the market as cream. Hence it is not possible to determine from the available data whether the large distributors have a fluid-milk supply as even as those of some of the smaller distributors. The producers delivering to the fluid-milk plants of a large distributor may as a matter of fact have as little seasonal variation in production as producers delivering milk to the smaller dealers.

If there is a general tendency for even producers to become associated with specialized fluid-milk distributors, it follows that such

producers tend to receive higher average annual prices than more uneven producers under an individual-distributor pool. By and large, this seems to be the tendency, but it is probable that it works out very roughly. There are wide variations in the seasonality of production of different producers, even in the same general type of farming area, and a distributor may find it more feasible in many cases to take the milk as it comes, rather than try to segregate the even from the uneven producers, since this may involve difficulties in assembling that offset any gains attributable to securing an even supply of milk. However, there is the possibility that even producers and specialized distributors become associated in such fashion that even producers receive higher average annual prices, other factors being the same, than producers who show a fairly wide seasonal variation in production and perhaps tend to become associated with distributors who utilize a relatively lower proportion of their total receipts as fluid milk.

Another factor that must be given consideration in this connection pertains to the seasonal course of class I prices in the market. If class I prices are held relatively constant on a seasonal basis,³¹ and if it is assumed that average annual prices in the market are held at the same level as would obtain in the absence of organization of the supply, it follows that the seasonal variation in average prices is reduced and summer prices are raised in relation to winter prices.³² Under such circumstances, producers having a seasonal variation in production inverse to that for the market as a whole, and even producers, would tend to receive lower average annual prices than they would receive in the absence of organization of the supply, since, with seasonally constant class I prices and no difference in average annual prices with and without organization of the supply assumed, it follows that winter prices are lower, and summer prices higher, than would be the case otherwise. Even producers would sell relatively the same volume at lower prices during the winter and higher prices during the summer, and, unless the gain in summer prices offsets the loss incurred because of lower winter prices, they would tend to receive lower incomes under the individual-distributor pool device than they would receive if the supply were not organized, other factors being the same. The same statement holds true with respect to the average annual prices received by the producer having a seasonal variation in production inverse to that of the market as a whole, except that the average annual price received by him probably would be reduced relatively more than that received by the even producer. These two types of producers probably would still receive higher prices than producers whose seasonal variation in production is approximately the same for the market as a whole, but from the standpoint of their individual operations they may find that the individual-distributor pool works to their disadvantage. This disadvantage may be offset by introducing another element into the price structure, such as raising the level of average annual prices, or by other methods, such as one where certain producers are given premiums in addition to the pool prices received. This possibility is discussed in a later section.

³¹ Relative to the seasonal variation in prices that would obtain without organization of the supply.

³² See sec. II preceding.

IV. SOME EFFECTS OF THE MARKET-WIDE POOL WITHOUT RATING UPON PRICES RECEIVED BY PRODUCERS

The market-wide pool without rating³³ is a method of prorating among producers the proceeds of sales to distributors on the basis of market utilization, that is, all producers receive the same weighted average price f. o. b. city, such weighted average price being a function of the ruling classified prices and the proportion of the total volume of milk sold in each class in the market as a whole. The analysis given in the preceding section also serves to indicate in a general way the manner in which the market-wide pool without rating affects prices and returns to individual producers, with the exception that it gives no recognition to the probable tendency for even producers to become associated with specialized distributors and is probably not as preferable as the individual-distributor pool without rating in this respect. Thus, under a market-wide pool without rating and with a policy of maintaining relatively constant class I prices in the market, the changes in average annual prices received by even producers and producers who have a seasonal variation in production inverse to that for the market as a whole probably may become even more pronounced than under the individual-distributor pool. Such producers probably will receive higher average annual prices than producers whose seasonal variation in production is approximately the same as that prevailing for the market, but, if average annual prices are maintained at the same level as would obtain without organization of the supply, the prices they receive and their incomes considered from the standpoint of their individual operations probably are reduced.

According to Black, such a plan may work satisfactorily in some markets, depending upon the relevant circumstances affecting the market.³⁴ On the whole, it appears reasonable to believe that such a pooling device may operate satisfactorily provided distributors closely approximate the average as far as utilization is concerned, and provided producers closely approximate the average in seasonal variation in production. Such circumstances probably may be expected to occur in small markets, where the supply tends to be drawn from a small area wherein farmers follow a rather well-defined type of farm organization and operation. The situation is far different in large markets drawing their supplies from an area which differs markedly from section to section within the area in type of farming and other factors that lead to differences in the seasonal variation in production of different producers.

"One of the common situations in which it does not work acceptably is where wide differences exist within the area as to seasonality of production, especially if these are based on natural differences. Take, for instance, a milkshed comprising at one extreme a somewhat distant mountainous pasture-farming area, and, at the other, nearer to market, a general diversified farming area with an abundance of corn and small grain. A single-price pooling system in such a milkshed would retard a tendency toward more uniform milk flow in the second area, and, in effect, subsidize the other area at its expense. A pooling sys-

³³ See ch. 2, sec. III.

³⁴ "Nevertheless, it must be admitted that the great rank and file of members of many cooperatives approximate the average in the matter of seasonality of production, and likewise the dealers in the proportion of class I sales. Most of those deviating from the average, work constantly closer to it. In such situations, therefore, a pooling system tends to accomplish rough equity as between members and to work acceptably, provided it is properly handled." Black, J. D., *The Dairy Industry and the AAA*, ch. VII, p. 194.

tem tends to break down in such a milkshed, and the cooperative with it. This happens especially when independent dealers, or even rival cooperatives, perhaps new ones that spring up, offer or provide premiums of one form or another to producers having the more even milk flow. This pulls away the very members who are most needed to keep seasonal surpluses down. In consequence, the pool price is reduced further relative to the outside price; and the process goes on till the cooperative can no longer stand the strain."³⁵

In general, it appears that the market-wide pool without rating may work satisfactorily in small markets. In large markets, it is likely to move counter to tendencies that would prevail otherwise, since it may partially ignore (1) the differences in average annual prices that different producers would tend to receive without organization of the supply and (2) the tendency of even producers to become associated with specialized fluid-milk distributors.

V. SOME EFFECTS OF THE MARKET-WIDE POOL WITH RATING UPON PRICES RECEIVED BY PRODUCERS

The market-wide pool with rating is a method of prorating among producers the proceeds of sales to distributors whereby each producer is given an allotment or quota or basic with respect to which he will receive the class I price, or the blended class I and class II price, as the case may be, all milk delivered in excess of the allotment being paid for at the price for excess milk. The "basing" or rating period is usually the season when production within the area and fluid-milk sales are more nearly in balance than during other periods of the year, usually the season of relatively low production. It follows that even producers' ratings constitute a larger proportion of their total milk sales; hence, such producers will ordinarily receive higher weighted average prices than uneven producers, other factors being the same, since relatively less of their milk is priced at the lower excess or surplus prices. The same statement holds true for inverse producers, unless penalties are prescribed for delivering less than the rating.

The importance of ratings, considered in relation to prices received by producers, is indicated by the figures set forth in table 37, which shows the weighted average price received by producers f. o. b. Baltimore, the percentage established ratings are of total deliveries, the percentage delivered ratings³⁶ are of total deliveries, and the percentage deliveries during the month of low deliveries are of deliveries during the month of high deliveries. The prices for milk given in table 37 have been adjusted to a 4-percent butterfat content.

The relationship between weighted average prices to producers f. o. b. city and the percentage delivered ratings are of total deliveries is set forth in figure 38, which shows that there is a decidedly close positive relationship between these two factors. The closer the relationship between delivered bases and total deliveries, the higher the weighted average price received by producers.³⁷ Thus it is clear that, in markets operating under rating plans, the rating the producer re-

³⁵ *Ibid.*, pp. 194-195. It should be noted that Black uses the term "pooling" in connection with the market-wide pool without rating. According to the terminology used in this treatise, "pooling" is the general term applied to any method of prorating among producers the proceeds of sales to distributors. Hence, Dr. Black's remarks quoted above need to be interpreted as applying to market-wide pools without rating.

³⁶ Delivered ratings vary from established ratings, depending upon whether producers deliver a volume above or below their established rating.

³⁷ At the time these figures were collected, producers in the Baltimore market were assigned two ratings, one a milk rating, the other a cream rating. These two ratings were combined in the analysis.

ceives is very important, since under a given schedule of class prices it largely determines the prices the individual producer will receive for milk.

The question arises as to whether the rating plan operates in such a manner that even producers, who would tend to receive higher average annual prices without organization of the supply, actually receive higher average annual prices when operating under the rating plan. Whether this is the case depends upon such factors as the relationship between the volume of fluid milk sales in the market and the total volume of production in the supply area, the manner in which ratings are established, the seasonal course of class I prices in the market, and other factors. An example of the relationship between evenness

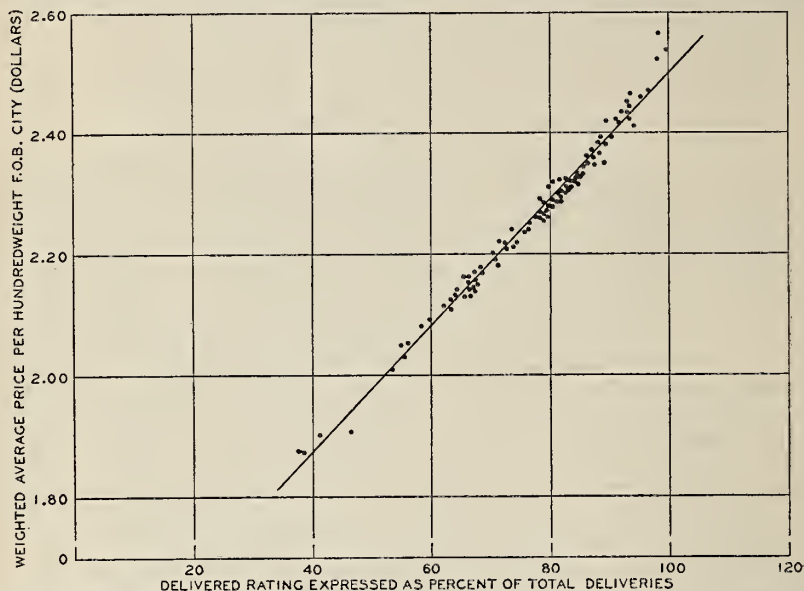


FIGURE 38.—Relationship between weighted average prices to producers f. o. b. city and delivered rating expressed as percentage of total deliveries, Baltimore, Md., 1934.

in production and the size of the rating allotted to individual producers is secured from an analysis of the figures given in table 37.³⁸ Examination of the figures given in table 37, and plotted in figure 39, indicates that there is a positive relationship between evenness of production and the size of the established rating of individual producers, although there is an appreciable scatter about the line of average relationship. This relationship becomes even more marked when producers are classified in accordance with the degree to which their delivered ratings approximated total deliveries. Some producers delivered milk in excess of their total milk and cream ratings, others delivered milk in excess of their milk rating but not in excess of their cream rating, and others delivered a volume of milk which was below their milk rating during some portion of the year.

³⁸ It should be noted that this relationship is given only as an example of how the rating plan as administered in the Baltimore market has resulted in paying producers in accordance with their seasonality in production. It serves only as a general example of the relationship that may be expected, and should not be construed as representing the actual situation in other markets. Nor is an appraisal of the Baltimore rating plan attempted. The material presented is merely illustrative.

TABLE 37.—*Weighted average prices received by producers f. o. b. city, established ratings and delivered ratings expressed as percent of total deliveries, and deliveries during the month of low deliveries expressed as percent of deliveries during the month of high deliveries, 101 members of the Maryland State Dairymen's Association, 1934*

Shipper no.	Weighted average price f. o. b. city	Established rating expressed as percent of total deliveries	Delivered rating expressed as percent of total deliveries	Deliveries during month of low deliveries expressed as percent of deliveries during month of high deliveries	Shipper no.	Weighted average price f. o. b. city	Established rating expressed as percent of total deliveries	Delivered rating expressed as percent of total deliveries	Deliveries during month of low deliveries expressed as percent of deliveries during month of high deliveries
	<i>Dol. per cwt.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>		<i>Dol. per cwt.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>
1.....	1.865	39.20	39.20	54.41	52.....	2.289	79.47	79.34	64.70
2.....	1.869	38.59	38.59	35.01	53.....	2.290	83.63	80.99	43.27
3.....	1.895	41.58	41.58	50.27	54.....	2.291	82.14	82.14	77.73
4.....	1.910	47.19	47.19	35.75	55.....	2.292	86.66	79.28	35.55
5.....	2.013	54.08	54.08	53.62	56.....	2.297	82.49	81.88	55.01
6.....	2.027	56.44	56.39	36.62	57.....	2.298	84.84	82.49	45.57
7.....	2.045	57.39	57.39	63.51	58.....	2.301	82.84	82.84	66.95
8.....	2.052	56.30	56.30	43.83	59.....	2.303	82.26	82.26	56.42
9.....	2.077	59.33	59.33	52.17	60.....	2.306	84.47	83.32	69.49
10.....	2.086	60.64	59.83	39.02	61.....	2.307	83.71	82.54	54.93
11.....	2.108	64.14	63.08	38.72	62.....	2.310	83.95	83.95	71.17
12.....	2.113	63.99	63.99	46.41	63.....	2.312	81.92	80.06	50.55
13.....	2.121	66.23	63.85	31.84	64.....	2.314	84.09	83.01	55.51
14.....	2.134	65.88	65.88	57.44	65.....	2.319	88.64	83.37	40.13
15.....	2.134	65.28	65.28	40.30	66.....	2.319	84.41	84.41	75.40
16.....	2.134	57.70	67.02	36.68	67.....	2.322	85.35	84.54	67.89
17.....	2.135	64.95	64.95	43.57	68.....	2.323	83.94	82.95	59.94
18.....	2.139	69.34	66.81	32.88	69.....	2.324	91.01	80.80	39.85
19.....	2.145	67.46	67.46	67.57	70.....	2.324	85.22	84.62	51.66
20.....	2.147	67.71	67.71	79.24	71.....	2.327	85.65	85.37	65.92
21.....	2.151	67.37	67.37	61.19	72.....	2.329	85.35	85.24	70.50
22.....	2.154	68.95	68.49	48.85	73.....	2.331	89.52	84.76	48.17
23.....	2.155	67.91	67.91	43.86	74.....	2.333	86.90	85.74	63.23
24.....	2.160	69.02	67.02	24.10	75.....	2.336	88.88	85.90	52.71
25.....	2.160	68.41	67.30	40.69	76.....	2.345	92.50	90.14	63.08
26.....	2.165	69.44	69.44	63.60	77.....	2.346	86.94	86.94	84.38
27.....	2.173	71.50	68.35	33.64	78.....	2.347	87.89	87.51	65.86
28.....	2.178	69.02	69.02	59.68	79.....	2.357	89.53	87.90	61.91
29.....	2.184	71.62	71.57	53.21	80.....	2.362	90.02	88.20	64.13
30.....	2.186	71.82	70.71	41.86	81.....	2.363	91.26	88.19	76.54
31.....	2.198	75.28	71.39	24.94	82.....	2.364	87.66	86.79	49.15
32.....	2.207	73.94	73.94	64.07	83.....	2.379	94.41	88.78	53.65
33.....	2.207	73.27	73.27	65.06	84.....	2.379	92.64	90.10	62.44
34.....	2.208	75.52	73.04	37.33	85.....	2.386	91.00	91.00	80.23
35.....	2.211	73.85	73.85	63.80	86.....	2.387	95.91	88.58	48.58
36.....	2.216	72.40	72.36	70.90	87.....	2.414	99.26	95.04	72.30
37.....	2.217	73.98	73.73	51.04	88.....	2.418	96.19	92.37	66.40
38.....	2.231	75.51	75.51	60.80	89.....	2.418	98.06	92.45	52.00
39.....	2.241	77.24	74.31	37.53	90.....	2.419	95.82	93.53	73.02
40.....	2.241	77.64	76.97	44.15	91.....	2.420	106.19	90.28	38.60
41.....	2.245	76.94	76.94	56.45	92.....	2.425	98.75	92.74	56.58
42.....	2.257	78.59	78.59	57.32	93.....	2.428	96.94	94.34	76.54
43.....	2.261	82.05	78.42	45.33	94.....	2.435	99.66	94.11	51.97
44.....	2.263	79.41	78.58	52.59	95.....	2.473	103.79	93.85	55.80
45.....	2.268	78.93	78.74	63.20	96.....	2.458	100.09	94.25	64.10
46.....	2.269	80.97	78.53	41.61	97.....	2.464	102.61	95.95	65.05
47.....	2.274	81.78	79.93	57.95	98.....	2.472	101.62	97.73	79.39
48.....	2.274	80.06	79.83	58.87	99.....	2.516	111.34	98.95	62.05
49.....	2.279	80.78	80.78	60.82	100.....	2.528	112.83	99.71	72.98
50.....	2.281	81.43	80.48	58.28	101.....	2.555	115.59	99.31	57.99
51.....	2.287	81.88	81.52	63.16					

Computed from unpublished data in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

The relationship between evenness in production, measured by the percentage deliveries during the month of low deliveries are of deliveries during the month of high deliveries, and the size of the rating of producers who did not deliver a volume of milk below their established milk and cream rating at any time during the year, are shown in figure 40. The same relationship for those shippers who did not deliver a volume of milk equal to their total milk and cream ratings at some time during the year is set forth in figure 41, and in figure 42 for those

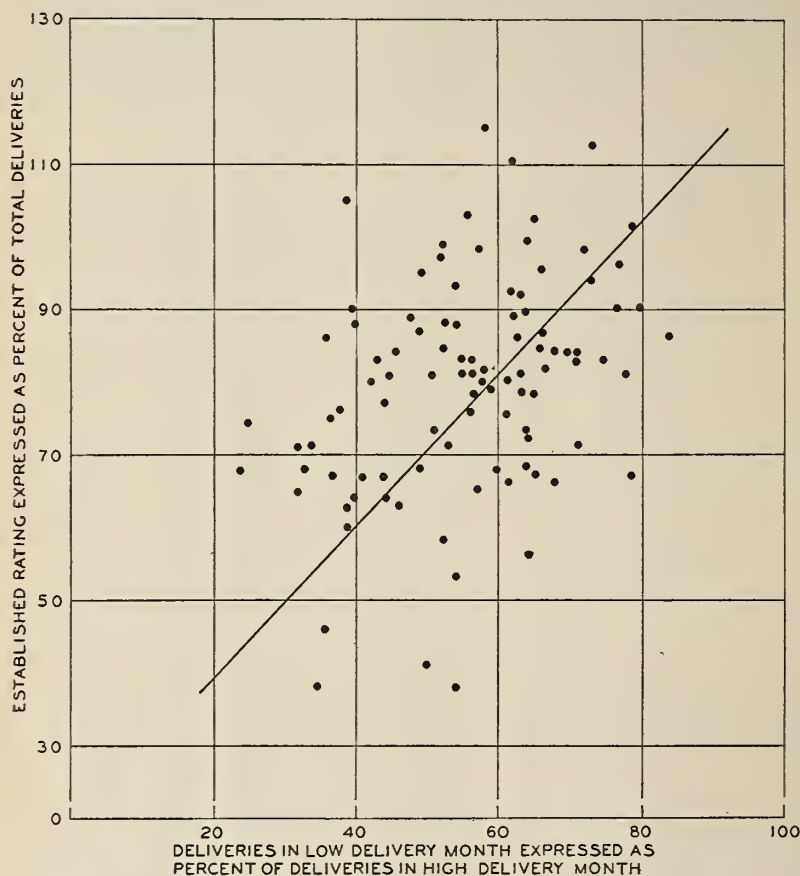


FIGURE 39.—Relationship between evenness in deliveries and established rating expressed as percent of total deliveries, Baltimore, Md., 1934.

shippers whose deliveries dropped below their milk rating at some time during the year. There is a positive relationship between evenness in production and the size of the established rating indicated for all the groups studied. Some producers appear to be overrated or underrated, considered merely in relationship to evenness of production. However, figures for 1 year only were analyzed, and hence the statement above might be subject to modification if figures covering several years were analyzed. Furthermore, the ratings granted will no doubt depend in part upon the purpose in view. If the rating plan is considered as a production-control device, then producers who do not

deliver in excess of their ratings, and hence receive higher prices, may properly be considered as "better" producers and entitled to higher prices than those who deliver a volume of milk in excess of their ratings, even though they show a more marked seasonal variation in production than "excess" producers. In any case, the rating plan as administered in Baltimore has resulted, by and large, in the more even producers receiving relatively higher ratings and higher prices than uneven producers. The Federal Trade Commission reports that the "peace and quiet" in the market is due in part to shrewd management of the cooperative, which has succeeded in minimizing the price and surplus problems.³⁹ From this it may be concluded that, by and large, producers have been fairly well satisfied not only with prices charged distributors but also with the manner in which the proceeds of sales to distributors have been prorated to producers.

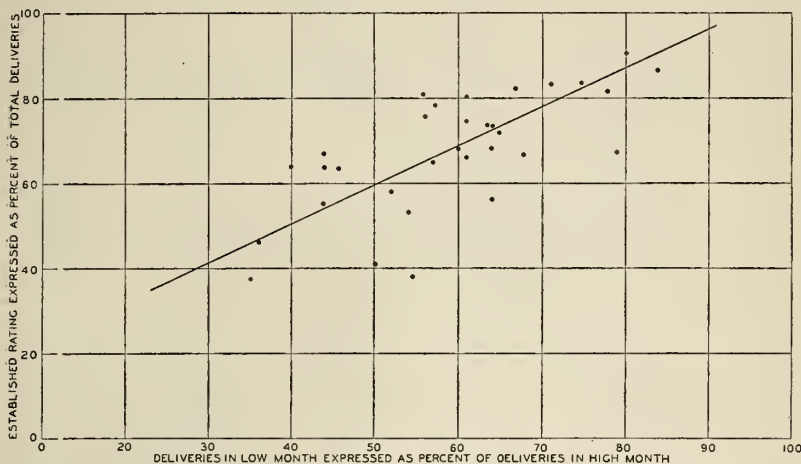


FIGURE 40.—Relationship between evenness in deliveries and established rating expressed as percent of total deliveries, for shippers delivering at least 100 percent of milk and cream ratings, Baltimore, Md., 1934.

Another problem of importance in pricing milk to producers is that of the producer who has so adjusted his production that he reaches peak production during the short period, when, in the absence of organization of the supply, prices might be expected to be higher than during the flush season. Under such conditions this type of producer would tend to receive even higher average annual prices than the even producer. Thus any pooling scheme that does not recognize the position of this type of producer will tend to result in the elimination of all or part of the gains accruing to him on account of his production practices, yet if a sufficient number of producers followed this practice the seasonal variation in prices would tend to be reduced and the gain from such practice eliminated. Considered from the standpoint of evenness in production, such a producer may produce as

³⁹ "The history of the Baltimore milk market is one of peace and quiet as compared with most of the metropolitan markets of the country which have been examined. This may be ascribed in part to the fact that the one cooperative in this shed has by shrewd management succeeded in minimizing the price and surplus problems. In part it is due to the comparatively few milk distributors operating in the Baltimore sales area which situation is probably to some extent the result of the success in the handling of the price and surplus problems. In that market the importance of maintaining proper relationships between class and blended prices is fully recognized." Federal Trade Commission, Summary of Milk Market Regulation and Practices, Federal Trade Commission report to Congress, June, 4, 1936, p. 16.

unevenly as producers who reach their peak in production during the flush production season. It should be noted in this connection that producers following such production practices make it unnecessary for the milk supply area to be as large as would be the case if they were not producing their maximum seasonal output during the period of short production, which may result in f. o. b. city prices being lower than would be the case otherwise. However, if ratings are established on the basis of the period of low production for the market as a whole, the producer whose volume is at its seasonal peak will receive approximately class I or basic prices for all of his milk, unless penalties are levied for production falling below the established base.

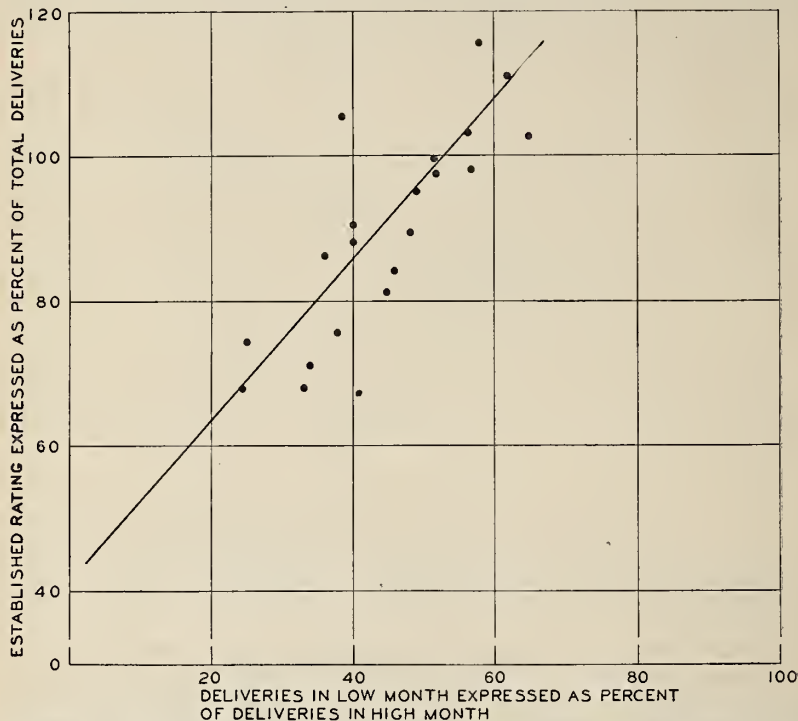


FIGURE 41.—Relationship between evenness in deliveries and established rating expressed as percent of total deliveries, for shippers delivering less than milk and cream ratings, Baltimore, Md., 1934.

VI. PRODUCERS' RESPONSE TO PRICE

In this section consideration is given to the subject of producers' response to price under various pooling devices. It is first assumed that: (1) There are differences in the seasonal variation in production of different producers; (2) seasonal variation in production for the market as a whole is quite marked; (3) there would be a wide seasonal variation in prices received by producers for all milk in the absence of organization of the supply; (4) the supply of milk is organized to a significant degree in relation to the total market supply; (5) a policy of maintaining seasonally constant class I prices is followed; (6) the average annual price for all milk is the same as would obtain without

organization of the supply; and (7) factors that would be associated with differences in prices received by different producers other than differences in seasonal variation in production, such as quality, location, and the like, are nonexistent.

Under the assumptions set forth above, except for the assumptions that the milk supply is not organized and class pricing and pooling are not followed, and in accordance with the treatment of the problem given in section II of this chapter, producers would tend to receive different average annual prices, with the highest prices being received by those having a seasonal variation in production inverse to that of the market as a whole, decreasing as their individual output curves

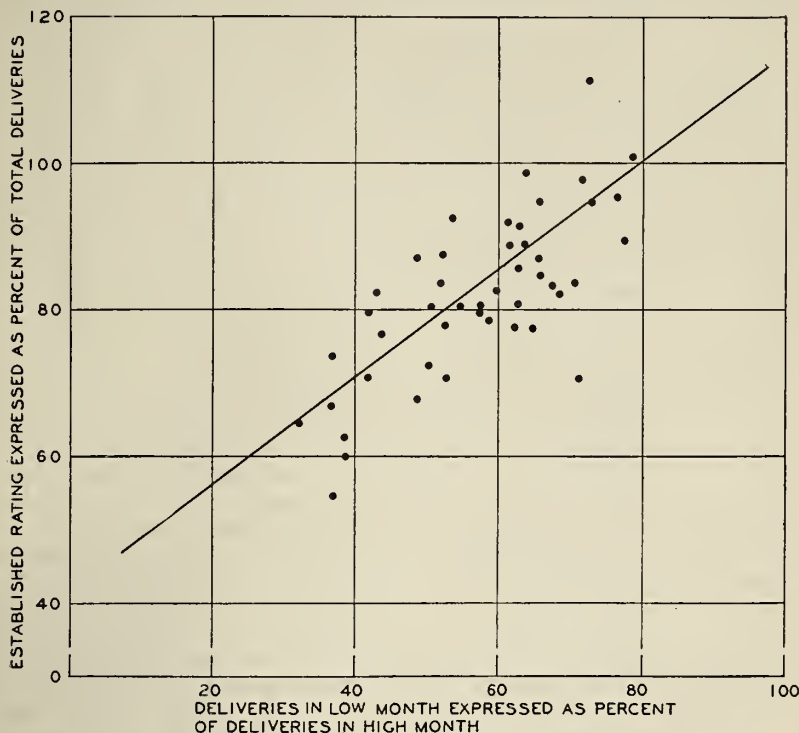


FIGURE 42.—Relationship between evenness in deliveries and established rating expressed as percent of total deliveries, for shippers whose deliveries were less than their milk rating at some time during the year, Baltimore, Md., 1934.

became less inverse, with the lowest being received by those producers whose seasonal variation in production is directly associated with, but of greater amplitude than, the seasonal variation in production in the entire supply area. The assumptions made above regarding organization of the supply and class I price policy are now brought into the analysis, and it is assumed further that proceeds of sales to distributors are prorated among producers through an individual-distributor pool. It is assumed further that even producers are associated with specialized fluid milk distributors and, prior to organization of the supply, were receiving some premium for evenness in production in addition to that portion of the price they receive which can be accounted for by their selling relatively more milk during the winter season than

the majority of the producers whose seasonal variation in production is approximately the same as that for the market as a whole. In accordance with the discussion given in section III of this chapter, the average annual prices received by inverse and even producers would tend to be reduced, the former more than the latter, and the prices received by producers approximating the market seasonal variation in production would tend to be increased, because of the raising of summer prices relative to winter prices. Under these conditions it is probable that, over a period of time, the even and inverse producers would tend to reduce their output, while the producers who receive an increase in their average annual prices would tend to increase their production. The degree to which these changes might take place would be a function of the degree to which the seasonal variation in prices for the market as a whole was reduced. Since the incentive to inverse and even production would be reduced to some extent, it is probable that inverse and even producers would tend to change their farm organization and operation in the direction of a seasonal output more nearly in accordance with that prevailing for the market as a whole. However, this change would probably be associated with an expansion of the milkshed due to a decrease in the volume of milk produced in the winter, unless the producers who would tend to increase production under this arrangement (summer producers) increased their production enough to offset the decrease which would probably take place in the production of inverse and even production. For the market as a whole, the seasonal variation in production would probably be increased because of the probability that inverse and even producers would tend to reduce winter production relative to summer production. Whether total annual production in the area would be increased or decreased would depend upon whether the increase in production on the part of summer producers would be offset by the tendency to a decrease in production by inverse and even producers.

An answer to this latter question can be ascertained only by an involved analysis of the differences in response to price changes by producers following different types of farm organization and operation. About all that can be set forth, as far as the qualitative analysis of the problem is concerned, is that the proration among producers of proceeds of sales to distributors under the conditions assumed would probably be associated with the production responses indicated above as far as different groups of producers are concerned. From the standpoint of market operation it is probable that inverse and even producers would be inclined to withdraw from the organization and sell their milk to flat-price buyers,⁴⁰ who for various reasons would probably be willing to pay them higher prices than they could secure by selling their milk through the organization. However, an arbitrary element may be introduced into the price structure, particularly with respect to class I prices, in an effort to hold such producers within the organization. This may handle the situation satisfactorily as far as the organization is concerned but is likely to result in an increase in supplies over a period of time, both from within the usual supply area, particularly on the part of summer producers who would tend to receive the greater part of the arbitrary increment (inverse and even producers having restored to them only part or all of their former price advantage), and from outside the usual supply area by producers who, with class I prices arbitrarily

⁴⁰ See ch. 7.

high, find it to their advantage to enter the fluid-milk market. The increase in supplies would therefore tend to result in a larger supply of excess milk, with the result that part or perhaps all of the arbitrary element would be eliminated as far as prices to producers within the usual supply area are concerned (the arbitrary element being spread over a larger supply). This would in turn be associated with the possibility that inverse, even, and perhaps summer producers within the usual supply area would tend to withdraw from the organization and sell their milk independently, perhaps to flat-price buyers or to distributors purchasing only a part of their supply from the organization. The latter possibility becomes stronger the greater the arbitrary element in class I prices, and tends sooner or later to force a reduction in class I prices and the elimination of some of the milk within the expanded supply area.

The analysis given above with respect to production responses to prices under an individual-distributor pool suffices in a treatment of this problem under a market-wide pool without rating. The major difference is that the proration of the surplus over all producers removes the advantage which even producers may have had under an individual-distributor pool because of being associated with specialized fluid-milk distributors. Under such conditions it would appear reasonable to expect that even producers would shift their production to a greater degree than under an individual-distributor pool. Also, they would probably be inclined to withdraw from the organization more quickly and sell their milk independently. If annual prices are raised above what they would be in the absence of organization of supply it is probable that an increase in production would result, the size of the increase being associated with the amount of the arbitrary element.

Producer responses to price under the rating plan of prorating among producers the proceeds of sales to distributors may be classified into two broad categories, these being (1) seasonal and (2) total production responses. The former is treated first in this discussion.

It has been shown that in the absence of organization of the supply, and with a fairly wide seasonal variation in production, there tends to be a marked seasonal variation in the price received by producers generally for all milk, and that there tend to be wide variations in the average annual prices received by different producers, depending upon their seasonal variation in production relative to that of the entire supply area.

Now, suppose that a rating plan is made operative in the market, and assume that the producers' output during the season of low production for the supply area as a whole is taken as the rating period. The higher the producers' level of production during this period, the higher the weighted average price they may expect to receive for their milk. Under such circumstances the producer would tend to increase his production during the short-production season, since this conditions to a large extent the amount of milk for which he will receive the higher class I or blended class I and class II price, as the case may be, throughout the year. If, then the ratings are open, that is, subject to year-to-year revision on the basis of the producers' output during the season of low production, producers will tend to increase their production during this period. If, on the other hand, ratings were established once and for all, subject to general

revision only when indicated on the basis of increased sales of fluid milk, and to revision as far as the individual producer is concerned only when it is shown that the base period used came at a time when the individual's production was not normal, on account of accidents and the like, there would be little reason to expect any marked production response, at least on a seasonal basis. The closed rating might be associated with some response on the part of certain producers to whom it might not reflect their previous price relationships with other producers, but there seems little reason to expect closed ratings to be associated with a shift in the seasonal variation in production for the market as a whole, since the incentive to increase production during the rating period in the hope of being able to secure fluid milk or blended fluid milk and fluid cream prices on a higher proportion of total annual production is removed.

It may be concluded from the foregoing analysis that when ratings are open,⁴¹ and when producers have knowledge of the period that will be used as the rating period, there will be a rather marked tendency for production to increase during the rating period relative to production during the remainder of the year. The seasonal production response to the rating plan as administered in the Philadelphia milk market tends to bear out the conclusion above. The method of establishing ratings in the Philadelphia market during the period 1921 to 1934 was as follows:

(1) From 1919 through September 1926, inclusive, the producer's rating was the average of his shipments during the months of October, November, and December of the preceding year.

(2) In August 1926 it was announced that:

(a) The rating established during October, November, and December 1925, would continue to be effective during the fall of 1926.

(b) The rating established in 1925 would continue to be effective during 1927, or until further arrangements were made.

(c) The ratings of October, November, and December, and of succeeding years, were to be recorded for possible use at some later time in negotiating for the sale of members' milk.

(3) In January 1927 producers were given a rating equal to the rating established on the basis of shipments during October, November, and December 1925, or average shipments during the same months of 1926, whichever were higher.

(4) In 1928 the rating was the average shipments during October, November, and December 1927, plus the 1927 rating, divided by 2.

(5) In 1929 the rating was average shipments during October, November, and December 1928, plus average production of October, November, and December, 1927, plus 1927 rating, divided by 3.

(6) In 1930 the rating was average shipments during October, November, and December 1929, plus 1929 and 1928 ratings, divided by 3.

(7) In 1931 ratings amounted to average shipments during October, November, and December 1930, plus 1930 and 1929 ratings, divided by 3.

(8) The rating in 1932 was the same as in 1931.

(9) The 1933 rating as 1932 rating plus average shipments during October 1932, divided by 2.

(10) The 1934 rating was the 1933 rating, plus average production of July and November 1933, divided by 3.⁴²

The foregoing indicates that the Philadelphia market has been operating under a rating plan wherein the producer made a new rating nearly every year, during a fairly well defined rating period, the months of October, November, and December. Even in those

⁴¹ This is entirely aside from the question of whether ratings are open in the sense that new producers are given ratings.

⁴² The information given regarding the Philadelphia rating plan was taken from an unpublished paper by P. E. Quintus, in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

years when the ratings appeared to be closed, subsequent modifications probably were not sufficient to keep the producer from reacting much as if the ratings were open. Under the rating plan thus administered it is to be expected that producers would shift their seasonality of production in the direction of relatively greater production during the usual rating period, in an effort to secure the higher "rating" prices for a greater portion of their milk, and this is what took place in the Philadelphia market. In 1920 the index of seasonal variation in shipments of producers shipping to one large distributor ranged from 78.5 percent in February, the month of low shipments, to 123.5 percent of the average for the year during the month of June, the month of high production. The range from the month of low shipments to the month of high shipments thus indicated was 45.0 percent of the average monthly shipments for the year. (See table 38.) While shipments to only one large dealer are used, it is believed the figures accurately portray the seasonal variation in shipments within the Philadelphia supply area. Over the period of years during which the rating plan was in effect in the Philadelphia market there was a marked decline in the seasonal variation in shipments. Since February 1923 the February index has not fallen below 90 percent of the average, and there has been a marked decline in May and June shipments relative to shipments during the remaining months of the year. (See fig. 43.) This is the type of production response that should be expected when the ratings are open and a particular period of the year is used as the rating period. Producers organize their production in such fashion that they are producing as much milk as is feasible in view of their particular type of farm organization and operation, in order to secure as large a rating as possible for the class I or blended class I and class II, or rating (basic), price, as the case may be.

TABLE 38.—*Index of seasonal variation in shipments of all shippers, shipping to 1 large Philadelphia distributor, 1920-33, inclusive.*

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>
1920-----	83.1	78.5	82.4	98.7	113.7	123.5	117.6	111.7	105.9	100.6	96.1	88.2
1921-----	81.1	82.8	90.0	107.2	119.4	121.7	116.1	108.4	106.1	95.6	89.4	82.2
1922-----	87.1	88.2	92.7	105.6	116.3	120.2	113.5	105.6	100.6	93.8	89.9	86.5
1923-----	87.5	83.0	86.5	94.4	105.8	111.3	112.3	107.3	107.8	105.8	103.9	94.4
1924-----	93.3	92.9	92.4	98.1	106.6	110.4	108.1	102.9	102.4	100.5	97.6	94.8
1925-----	91.5	92.4	92.9	100.5	110.4	114.1	112.2	106.2	102.9	95.8	91.0	90.1
1926-----	94.7	97.3	95.6	103.5	108.2	109.0	103.5	98.3	99.7	97.9	96.5	95.8
1927-----	95.5	93.2	94.0	104.4	109.3	109.4	105.2	100.2	99.3	97.5	96.6	95.4
1928-----	94.8	95.2	95.9	103.7	109.6	110.6	105.4	98.8	98.3	96.1	96.4	95.2
1929-----	93.1	93.2	94.3	104.8	109.4	109.3	101.5	95.1	96.8	98.2	102.1	102.2
1930-----	100.4	100.0	98.3	106.4	107.9	106.0	97.1	90.2	91.5	95.1	102.1	105.0
1931-----	103.0	101.1	98.9	101.2	106.4	104.9	101.1	96.5	96.8	94.9	96.6	98.6
1932-----	99.3	98.8	97.2	103.1	106.9	106.0	100.8	94.6	97.8	98.1	100.5	96.9
1933-----	94.2	93.6	93.0	100.6	102.6	105.8	104.2	102.8	102.2	100.6	100.7	99.7

Computed from data in the files of the Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

Different producers may be expected to show different production responses to any sort of pricing device, depending upon their system of farm organization and operation. Some producers with plentiful pastures, following the practice of light winter feeding, may not find it to their advantage to shift the seasonality of their production. Others with little pasture who rely mainly on purchased feeds may find it to their advantage to bring about a material change in the

seasonality of their production. These suggested conclusions seem to be borne out by the results of a study of the rating plan in relation to milk production in the Philadelphia milkshed, by F. F. Lininger, who found that general farms with pasture and dairy farms showed a wider range in production from the high to the low month (expressed as a percentage of basic amounts) in 1925-26 than in 1921-22.⁴³ On the other hand, general farms with little pasture and crop farms showed a marked decline in the range in production from the high month to the low month from 1921-22 to 1925-26.⁴⁴

The foregoing treatment of the seasonal production response to price, under the system of pricing milk to producers that has existed in the Philadelphia milk-supply area since 1921, may be taken as an example of the response to be expected under a system of open ratings. The degree to which producers would shift the seasonality of production in any market would depend, of course, upon the numerous factors operating to make it more or less desirable to the individual producers

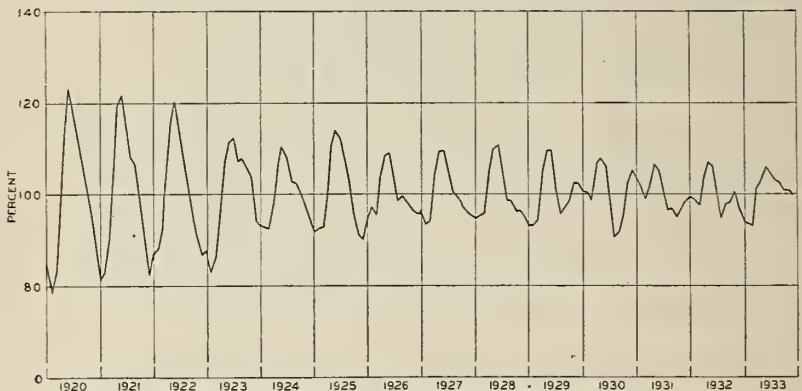


FIGURE 43.—Seasonal variation in shipments to one large distributor in the Philadelphia, Pa., milk-supply area, 1920-33.

making up the supply to shift their seasonality of production. This probably can be ascertained only after experimentation or trial and error in the market, although the direction of the change may be expected to be toward higher relative production during the rating period.

It is interesting to compare the production response to price under the rating plan of pricing milk to producers as administered in the Baltimore market with that obtaining under the rating plan as administered in the Philadelphia market. Since 1924 the ratings in the Baltimore market have been more or less closed, that is, the producer could not be sure that his production each fall would be the basis for establishing his rating during the following 9 months. Thus it is possible to compare the results of the plan in a market where the ratings have generally been more or less open with one where the ratings have been more or less closed for some time. Also, it is possible to compare the seasonal variation in shipments in the Baltimore market during the period when ratings were open and during the

⁴³ See ch. 3, sec. II, for a definition of types of farming used in the study cited.

⁴⁴ Lininger, F. F., *The Relation of the Basic-Surplus Marketing Plan to Milk Production in the Philadelphia Milkshed*, Pennsylvania State College Bulletin No. 231.

period when they were closed. The following is a summary of the periods used in establishing ratings in the Baltimore market:

January 1, 1919, to January 1, 1924; average production for October, November, and December of the previous year.

January 1, 1924, to April 1, 1924; average production in October, November, and December 1922.

April 1, 1924, to September 1, 1924; average production in October, November, and December 1923.

September 1, 1924, to December 31, 1924; average production in October, November, and December 1922.

January 1, 1925, to December, 1928; average production in October, November, and December 1921, 1922, 1923.

For 1927, any member who failed to maintain 80 percent of his established basis, during October, November, and December 1926, was automatically given such new average as he did maintain as his new basic quantity. For 1928, unless the producer produced 90 percent of the old average, he was given the new one, and, for 1929, this requirement was raised to 100 percent.⁴⁵

The plan further provided for the adjustment of bases if conditions warranted, by increasing or decreasing ratings in accordance with increases or decreases in fluid-milk sales. The ratings were reduced 5 percent on January 1, 1931, and an additional 5 percent decrease in ratings was made in May 1932. On September 1, 1932, cream ratings were established based upon the amount of excess milk shipped during the entire year 1931. Higher relative cream ratings were given to those producers having the smaller relative bases.⁴⁶

The information given above regarding the method followed in establishing ratings in the Baltimore market indicates that the ratings were open until 1924, after which they were more or less closed. During the period when ratings were open there was a marked decline in the seasonal variation in production in the Baltimore milk-supply area. In 1920 production ranged from 90.7 percent in February, the month of low production, to 115.5 percent in July, the month of high production, of the average for the year. In 1923 production ranged from 95.1 percent in March, which was the month of low production for that year, to 103.9 percent in June, the month of high production, of the average for the year. (See table 39.) As a matter of fact, production during the months of October, November, and December was almost as heavy as during the months of May, June, and July, the months during which production was ordinarily highest.⁴⁷ Thus, under the system of open ratings that prevailed in Baltimore prior to 1924, there was a marked reduction in the seasonality of production. The seasonal production response of producers to this system of pricing was in the direction of a marked increase in production during the months of low production. Once the ratings were closed, producers tended to shift the seasonality of their production back to one somewhat similar to that which probably prevailed prior to rating. The seasonal variation in production in the Baltimore milk-supply area was practically the same in 1932 as it was in 1920, with the exception that production in the former was lowest in November rather than February. In 1932 production ranged from 92.5 percent in November, the month of low production, to 111.5 percent in June, the month of high production, of the average for the year.

⁴⁵ Metzger, Hutzler, Cooperative Marketing of Fluid Milk, Technical Bulletin No. 179, U. S. Department of Agriculture, May 1930, pp. 65-66.

⁴⁶ Based upon an unpublished paper by P. E. Quintus, in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

⁴⁷ See the statement of Mr. Heaps, quoted in ch. 3, sec. III.

The range from the month of low production to the month of high production, expressed as a percentage of the average for the year, was 24.8 percent in 1920 as compared to 19.0 percent in 1932. (See fig. 44.) This tends to bear out the conclusion that, when the incentive to make a rating each year in the hope of securing a higher volume of sales at the higher rating prices (class I or class II or "basic" prices, whichever the case may be) is removed by closing the ratings, there appears to be little reason to expect an appreciable seasonal production response to price as determined by the plan of pricing milk to producers (prorating among producers the proceeds of sales to distributors). Hence, under a system of closed ratings the rating plan becomes a method of pricing milk to producers largely in accordance with their seasonality in production, without exerting any material tendency to be associated with a seasonal production response to prices as determined by the plan.

TABLE 39.—*Index of seasonal variation in production of milk, members of the Maryland State Dairymen's Association, Inc., May 1919 to April 1933, inclusive*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>	<i>Pct.</i>
1919	90.7	90.7	90.9	92.8	117.8	110.1	99.8	96.5	101.0	101.6	99.1	94.0
1920	92.4	93.1	96.3	106.6	102.7	110.5	115.5	110.3	107.3	101.9	95.7	91.0
1921	92.6	92.4	92.2	103.1	108.0	111.4	106.7	102.7	101.0	97.1	96.9	95.9
1922	95.4	96.7	95.1	102.4	102.6	103.9	99.8	99.6	101.1	100.4	102.5	100.5
1923	98.4	94.4	93.0	98.3	102.7	106.6	105.4	103.8	103.0	99.9	97.7	96.8
1924	96.1	96.3	96.0	104.4	108.6	110.6	107.3	102.1	99.0	92.9	92.5	94.2
1925	95.0	97.4	97.9	106.4	111.6	112.3	106.2	98.8	97.0	93.9	92.3	91.2
1926	90.8	93.3	94.6	105.2	111.0	112.5	106.5	100.4	98.8	96.0	95.0	94.9
1927	94.7	95.8	96.1	103.9	108.5	110.0	105.3	100.3	98.9	97.2	95.4	93.9
1928	92.4	93.9	94.9	106.3	112.0	113.9	105.9	98.8	96.8	95.0	95.4	94.7
1929	93.8	96.1	97.6	109.9	114.7	113.9	102.2	92.8	91.2	91.7	96.5	99.6
1930	100.8	100.8	99.2	106.2	108.9	108.6	102.7	97.3	95.7	92.9	93.0	93.9
1931	94.7	95.0	95.2	104.5	110.1	111.5	106.6	102.3	99.2	93.8	92.5	94.6
1932	95.2	96.0	95.3	103.4								
1933												

Computed from figures given in History of the Maryland State Dairymen's Association, History Series No. 2, National Cooperative Milk Producers' Federation.

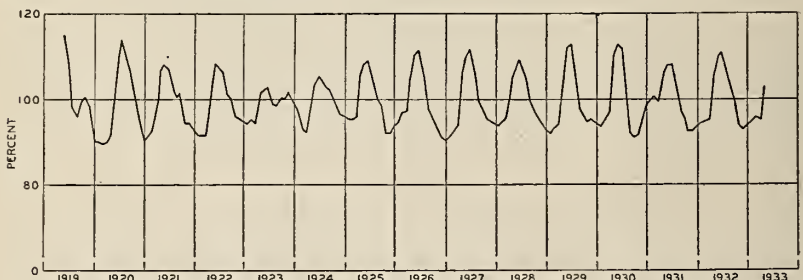


FIGURE 44.—Seasonal variation in production by members of the Maryland State Dairymen's Association, Baltimore, Md., June 1919–May 1933.

It is interesting in this connection to compare the course of seasonal variation in production in the Twin Cities market (Minneapolis and St. Paul, Minn.) with that in the two markets previously discussed. The Twin Cities market has never operated under a rating plan, although a classified-price plan is used in selling milk to distributors, and it is significant to note that there appears to have been little if any tendency for the seasonal variation in production to change materially. (See table 40, fig. 45.)

TABLE 40.—*Index of seasonal variation in production, all members of the Twin City Milk Producers' Association, July 1918 to July 1932, inclusive*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
1918.....							118.6	101.6	88.7	80.2	76.0	83.6
1919.....	95.4	102.7	104.0	113.7	119.5	123.3	113.7	97.0	84.5	77.2	80.8	88.2
1920.....	92.1	100.2	102.0	109.5	118.5	123.2	115.1	99.1	88.6	83.3	82.3	86.1
1921.....	93.5	101.1	107.7	120.2	127.0	123.7	109.4	90.4	82.6	76.9	81.6	85.9
1922.....	99.6	107.2	106.8	114.5	116.5	115.1	102.6	89.8	85.0	83.3	86.5	93.1
1923.....	99.6	103.4	104.0	111.2	114.0	112.8	105.0	93.2	87.1	84.3	89.4	96.0
1924.....	99.3	106.0	107.5	112.8	115.6	114.6	104.5	92.4	85.5	83.4	86.0	92.4
1925.....	98.0	102.2	103.7	113.1	118.9	120.5	109.7	93.2	82.4	79.1	85.8	93.4
1926.....	102.1	110.2	110.9	116.6	116.6	113.6	102.4	89.3	81.7	78.9	83.9	93.8
1927.....	98.2	106.0	107.3	115.6	119.4	119.4	106.3	91.0	82.0	80.0	83.6	91.2
1928.....	99.4	105.7	106.8	113.5	118.0	118.5	108.2	93.5	82.9	78.9	82.8	91.8
1929.....	97.4	103.2	105.8	115.1	120.9	121.0	108.8	91.1	80.9	78.7	84.8	92.3
1930.....	101.7	107.5	110.4	120.0	122.2	117.1	100.8	83.8	77.1	77.5	86.5	95.4
1931.....	108.5	114.2	112.9	116.5	113.9	107.8	94.1	80.4	77.9	80.9	91.5	101.4
1932.....	114.2	110.8	118.4	110.1	127.2	112.8	84.9					

Computed from figures given in Twin City Milk Producers' Association, History Series No. 7, The National Cooperative Milk Producers' Federation.

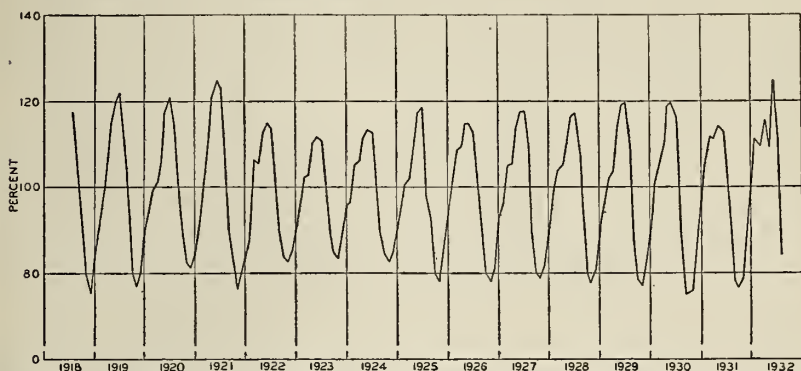


FIGURE 45.—Seasonal variation in production by members of the Twin City Cooperative Association, July 1918–July 1932.

Total production changes in response to prices as determined under a rating plan depend upon (1) the level of prices that are charged distributors in comparison with the level that would obtain without organization of the supply and (2) the method of setting ratings. Under an open rating system it may be that production is increased even though no effort is made to charge distributors more money for a given volume of milk on an annual basis. Producers, pointing their production practices toward securing a relatively larger volume of milk during the rating period (usually the season of low production), may produce more milk than would be the case otherwise. Black states: "Another effect not so much anticipated is that total production has commonly been increased. The extra cows taken on in building up base ratings have been kept in production in other months. The fall freshened cows have produced more milk in a year than the spring freshened cows. * * *

"In some cases another effect of the plan has been to shift the low production into months not in the base period, making necessary a widening of this period to include another month or two. In a few cases, 5 or 6 months are now being used. In certain instances, yearly averages have been used as bases, at least temporarily. Such

bases will also discourage high seasonal peaks in production, since these produce low blended prices. However, by keeping somewhat above the average, and in particular by not going below it, any producer can build up a higher base rating for the year following; hence this type of base determination stimulates total production also."⁴⁸

While there may be a tendency for total production to increase when there is a shift to a higher level of winter production relative to summer production, it is difficult to ascertain how this comes about on a rational basis unless the price-bargaining activities of the cooperative result in an increase in the total sales value of a given quantity of milk, which would probably have to be accomplished by securing class I prices that have some arbitrary element. On the other hand, it may be that producers, prior to rating, have tended to overestimate the costs of summer as compared to winter production and, when they are given some incentive to produce a relatively larger volume in the winter, may find it to their advantage to do so even though little of the incentive may remain over a period of time. It does not appear feasible to attempt to generalize in this matter. Careful analyses of the producers' response to price under different methods of establishing ratings, together with analyses of the prices charged distributors, need to be developed in several markets before other than tentative, qualitative generalization can be attempted.

Under a system of closed ratings, with no effort made to charge distributors a greater sum of money for a given volume of milk on an annual basis than they would pay without organization of the supply, there is little reason to believe there would be much change in the seasonality or total volume of milk produced within the usual supply area. There may be some change in seasonality and total production if the rating plan operates so that certain producers, the even and inverse producers, find the prices and incomes they receive reduced or increased. On the other hand, producers having a seasonal variation in production approximately the same as that for the market as a whole may change the seasonality and total volume of their production if the prices and incomes they receive are changed. For the market as a whole, the seasonality and total volume produced would depend upon the net balance of the changes that different types of producers might make. However, it is probable that the seasonal production response will not be as marked under a system of closed ratings as under a system of open ratings, because the incentive for the producer to point his production practices toward securing a higher volume of winter production as compared to summer production is largely removed.

Pooling problems become much more complicated if arbitrary pricing is attempted in the market. It has already been pointed out that there is a marked tendency for class I prices to be maintained at rather constant levels on a seasonal basis, so that the seasonal variation in the prices received by producers for all milk tends to be reduced in relation to what it would be if this practice were not followed. However, class prices may be set at such levels that average annual prices are not increased. This tends to change the prices and incomes received by even and inverse producers as compared to those received by producers whose seasonal variation in production is about the same as that for the market as a whole, under the individual-distributor

⁴⁸Black, J. D., *The Dairy Industry and the AAA*, ch. VII, p. 207.

and market-wide pools without rating. Rating plans tend to obviate these results and result in inverse and even producers securing higher prices and incomes, other factors being the same, than producers whose seasonality in production is approximately the same as that obtaining in the market. Whether the prices and incomes received by the former in relation to those received by the latter are changed depends upon the class prices charged distributors, upon production responses to prices as determined under the rating plan, and upon other factors. If the general level of prices is increased, especially on an annual basis, there will be a marked tendency for production to increase within the supply area and for milk to be attracted from areas that were not supplying milk for the market prior to the introduction of arbitrary elements into the price structure. (See ch. 4 and 5.) This will tend to reduce the weighted average prices received by producers, and will lead to serious questions in regard to prorating to producers the proceeds of sales to distributors, which in this case are lower on a per-unit basis than they would be if excess milk had not been attracted to the market, other factors being the same.

When total fluid-milk sales are materially less than total production during the period of the year when they should be nearly in balance (usually during the season of short production) it is probably due to arbitrary elements in the milk-price structure, particularly class I prices. Of course, consideration must be given to the possibility that such conditions are only temporary, but if the excess over fluid-milk requirements during this period of the year appears to be permanent the price structure needs to be closely examined and efforts made to reduce the arbitrary element. The greater the spread between class I prices charged distributors and weighted average prices received by producers (under the individual-distributor and market-wide pools without rating), the greater the incentive for producers, especially those located near the market, to withdraw from the organization and sell their milk to flat-price buyers or distributors who purchase only a part of their supplies from the organization, or to become producer-distributors.

Under a rating plan, if total ratings get very far out of line with total fluid-milk sales so that the prices received by producers for their ratings become low in relation to class I prices charged distributors, producers, especially nearby producers, have an incentive to respond in the manner set forth above as far as their sales outlets are concerned. Over a period of time these activities on the part of producers who find it to their advantage to withdraw from the marketing plan will tend to eliminate the arbitrary element in class I prices. However, such procedure is liable to be associated with strife and chaos in the market, and it would probably be much more desirable to remove the arbitrary element by reducing the level of class I prices before producer responses of the kind just mentioned are encouraged.

Fundamentally, the problem of reducing the quantity of excess milk in the market is that of making it economically disadvantageous for some producers to continue supplying milk for the fluid-milk trade, which, by and large, means a reduction in the ruling level of prices paid producers, which in turn would probably have to be accomplished in most instances by a reduction in the class prices charged distributors, especially class I prices. If this were done, many of the rating problems would probably cease to be very important, and ratings probably could be revised in such fashion that there would be a close relationship

between the total volume of milk produced within the supply area and fluid-milk sales during the season of short production.

This treatment of the problem may not be very satisfactory to producers, but any attempts to maintain the arbitrary element in prices charged distributors and keep producers satisfied by granting the malcontents preferred ratings or other preferential treatment are likely to introduce additional problems and lead to serious consequences in the long run. If a proper relationship between class I prices and rating prices, or class I prices and weighted average prices received by producers for all milk, is maintained, much of the incentive for producers to withdraw from the organization and sell to flat-price buyers or become producer-distributors, as well as much of the price competition from independent producers, is eliminated.

VII. SUMMARY

The facts and considerations set forth in this chapter may be summarized briefly, as follows:

(1) In the absence of large-scale organization of the supply for the purpose of selling milk to distributors, and with any given seasonal variation in prices paid producers, different types of producers would receive different average annual prices, other factors such as location being the same. These differences in prices would be a function of differences in the seasonal variation in production of individual producers. Those producers having a seasonal variation in production inverse to that exhibited by the total volume of production within the supply area for the market (inverse producers) would receive the highest average annual price. This would be due to the fact that ordinarily the inverse producers would sell a relatively larger portion of their total annual production during the period of the year when prices would normally be high on a seasonal basis. Producers who produce a fairly constant volume of milk throughout the year (even producers) would receive somewhat lower prices than the inverse producers, but would receive higher prices than the producers whose seasonal variation in production closely approximates or is greater than the seasonal variation in production for the entire milk-supply area.

(2) Once large-scale organization of the supply is introduced into the market structure, the relationships that would be expected to prevail among the average annual prices received by different types of producers, as noted above, may or may not be changed, depending upon the policies followed by the cooperative in pricing milk to distributors and in prorating among producers the proceeds of sales to distributors.

(3) If the cooperative follows the policy of maintaining class I (milk sold as fluid milk) prices constant throughout the year, the seasonal variation in weighted average prices f. o. b. city and f. o. b. farm would tend to be reduced, that is, summer prices would tend to be raised relative to winter prices. Unless offset by an increase in the level of prices due to the influence of large-scale organization of supply, inverse and even producers would tend to be in a less advantageous position than they were previously as compared to producers having a seasonal variation in production about the same as that for the entire volume produced in the milk-supply area. Such would be the case under the given conditions if proceeds of sales to distributors were prorated among producers by means of a market-wide pool without rating.

(4) Under the conditions noted above, but with proceeds of sales to distributors prorated among producers through an individual-distributor pool, the relative position of different types of producers with respect to average annual prices would differ from that prevailing prior to large-scale organization of the supply and prior to the institution of a policy of maintaining class I prices constant on a seasonal basis, such differences depending upon whether even producers were associated with specialized fluid-milk distributors. If even producers were associated with specialized fluid-milk distributors (distributors selling a high proportion of their total output as class I milk) it might be that the average annual prices they received would be about the same as those prevailing prior to large-scale organization of the supply in relation to those received by producers with a seasonal variation in production about the same as that for the market as a whole. Inverse producers probably would tend to be disadvantaged, since there is little reason to

expect them to be associated with distributors having a relatively large portion of their sales in the form of fluid milk.

(5) The relationships between the average annual prices received by different types of producers and the changes therein that would be brought about by different pricing and pooling policies of the cooperative probably would be changed from those noted above if proceeds of sales to distributors were prorated among producers by means of a market-wide pool with rating. A rating plan would tend to operate so that even producers would receive rating prices for a relatively higher proportion of their milk than other producers, except inverse producers if ratings were established during the short production period. This would be the case, because a relatively larger proportion of the total annual output of even producers (and inverse producers in the circumstances just noted) would be represented by rating (base) milk.

(6) Production responses to changes in prices as determined by different methods of prorating among producers the proceeds of sales to distributors depend upon numerous factors. As far as total annual production is concerned, it appears reasonable to believe that there would be little if any change provided there were no change in the total annual amount of money charged distributors for a given volume of milk. However, if ratings were open, it might be that producers would change their total annual output, the change being generally in the direction of increased production, on account of the incentive to build up ratings during the rating period. Also, the seasonal variation in production would probably be reduced. If ratings were closed, there appears to be little reason to expect any material change in the seasonality of production. Since different methods of prorating among producers the proceeds of sales to distributors probably would change the relative positions of different types of producers with respect to the annual average prices received by them, changes in total annual supplies might take place. Certain types of producers might be in a less advantageous position than they were previously, and total annual production might be increased or decreased depending upon the relative importance of the various types of producers and the relative elasticity of their supply.

The foregoing discussion is intended merely as a general qualitative treatment of pooling problems. Limitations of time do not permit complete treatment of the problems discussed, and many important problems encountered in pooling milk have been left for analysis at a later date.

CHAPTER 7

SOME PROBLEMS OF PUBLIC POLICY IN REGARD TO THE MILK TRADE

I. INTRODUCTORY

The preceding chapters of this treatise, having set forth the nature of the competitive conditions in the milk trade, may for that reason lead to certain inferences regarding public policy and the determination of milk prices. One general type of inference may be that the milk trade, being monopolistic in character, is subject to certain abuses and, therefore, public policy should be pointed toward the abolition of such practices as may appear to be inimical to the public interest. Another general type of inference may be that the milk trade is characterized by excessive profits, inefficiency of operation, or both, and that the gains of large-scale organization and operation are either not realized in the milk trade or else do not accrue to the public generally; hence, public policy should be pointed to correcting the situation.

For these reasons it appeared desirable to include one chapter dealing with some problems of public policy in regard to the milk trade. The problems center mainly around the question involved in promoting the public interest, since promoting the public interest is conceived to be the goal of public policy.

Certain sections of the chapter which follows may appear to wander far afield and be in the nature of an attack upon things that do not actually exist. Therefore, the intent of the chapter to discuss public policy as regards the milk trade on the basis of the theory developed in the preceding chapters, needs to be kept clearly in mind, else the relevancy of certain points that are developed to the discussion in hand may be overlooked. It should be stressed that the authors are not interested in presenting their views or conclusions on the public policy that should be developed for the milk industry. All that is intended is to set forth certain policies that could be followed, and discuss their advantages and disadvantages.

In discussing the public interest in the milk trade, the question immediately arises as to what group, or groups, are regarded as constituting the public. Perhaps a rather generally acceptable grouping or classification of those constituting the public might be: Producers, consumers, and distributors. However, for many purposes, this grouping has no particular relevancy since, if the discussion were pointed towards analysis of returns to factors of production in the milk trade, an acceptable grouping would be that of land, labor, capital, and entrepreneurship. Also, there are many subgroups under any suggested major groups that could be set up. For example, producers could be classified as specialized dairy producers and diversified farmers who also produce some milk, and it seems to be a

reasonable presumption that their interest in the milk trade would vary, depending upon its influence upon their individual welfare, since it is more important to the specialized milk producer than to one who produces milk in combination with several other enterprises.

For convenience in this presentation, the public interest is construed to embrace the three broad categories of individuals who at some point or another come into contact with the milk trade—consumers, producers, and distributors. Primarily, attention is focused upon the interest of that vast group of people, consumers, who purchase the finished product.

The meaning of the term “public” as it will be used throughout the remainder of this treatise having been set forth, the question then becomes one of defining the interest of the public in the milk trade. If one takes the position of the seller, in this case producer and distributor, his interest is probably that of securing as large an income from the milk trade as is possible in view of the supply and demand conditions affecting that industry. From the standpoint of the consumer it would appear that his interest is in securing a given volume of milk at prices that will continue to call forth the desired volume when produced and distributed as efficiently as may reasonably be expected.

The milk trade has long been subject to a large degree of public interest. The early manifestation of the public interest in milk was pointed mainly toward the chemical content, quality, and sanitary status of milk as then distributed. The realization slowly developed that milk, in addition to being a food having almost a preeminent position as far as food value is concerned, is easily contaminated and is a product in which bacteria grow prolifically unless proper caution in regard to sanitation is taken in handling the milk. Probably the first formal regulation of the milk trade dealt with sanitation of milk, its fat content, and the matter of adulteration. In any case, there is scarcely any city of appreciable size in the country today that does not set up quality requirements and rules and regulations which must be followed in order for a producer's milk to be qualified for city distribution. In many cases, certainly in the larger cities, milk inspectors are employed who make periodical inspection of producers' farms. Many of the larger cities require that a producer's barns and other equipment must meet certain requirements as to floor space, type of material used in the construction of floors and walls, etc. In addition, many cities require that milk be produced from cows free of tuberculosis, and insist that herds be regularly tested for tuberculosis. Some cities are now requesting that milk be produced from cows which have reacted negatively to the test for Bang's disease (contagious abortion). In addition to the rules and regulations applied to the production of milk on the farm, most cities usually have a set of rules and regulations which must be followed by distributors in handling the milk received from producers.

In comparatively recent years there has been a great deal of interest in the price of milk. The producer group probably has been most vociferous in this connection, especially during the World War period when prices paid them by distributors did not increase as rapidly as the prices of other commodities.⁴⁹ On the other hand, frequently in the past, and sometimes in the present, proposals to increase the price of milk are accompanied by a hue and cry in the newspapers, and threats

⁴⁹ See ch. 2.

and recriminations by representatives of both the consumer and producer groups. The prices of other commodities may change markedly without attracting much notice except here and there a rumble of protest by consumers or producers, depending upon the direction of the change. This is not so in the case of milk.

Perhaps the reason for the rather marked interest of all groups in the price of milk centers around the fact that what may appear to be an insignificant change in terms of unit prices, of, say, 1 cent per quart, amounts to an appreciable sum when considered in relation to the increase or decrease in total outlay that may be engendered by the change. For example, in the Boston market it is estimated that approximately 500,000,000 pounds of milk were sold as fluid milk (class I) in 1935. An increase equivalent to 1 cent per quart on this volume would amount to an increase of about \$2,325,000 in total outlay by consumers, and, assuming no change in distributors' margins, an increase of about the same amount in returns to producers.⁵⁰ The Bureau of Agricultural Economics of the United States Department of Agriculture estimates that in 1934 about 3,546,394,000 gallons of milk were used for consumption as fluid milk and cream by the nonfarm population. If prices had been increased 4 cents per gallon, the equivalent of 1 cent per quart, the increase in outlay for fluid milk and cream on the part of consumers would have amounted to about \$140,000,000. Thus it should be evident that as far as total outlay is concerned producers, consumers, and distributors, taken as groups, have a strong reason for being interested in the price of milk and changes therein.

From the technical standpoint, if milk prices were determined under conditions of simple competition no group could influence milk prices to any appreciable extent by bargaining, since prices would be determined by the free play of the economic forces of supply and demand and nothing could be done to influence prices.⁵¹ However, milk prices are not determined on the basis of the interplay of economic forces when the number of both buyers and sellers is large, but are determined under conditions of complex competition, largely by negotiation.

When prices are determined on the basis of the negotiations of groups, rather than more or less mechanistically, as would be the case under conditions of simple competition, each group is actively concerned to see that it makes the best bargain possible. Under such circumstances the stage is set for a large element of suspicion on the part of the groups affected. It has been noted that one of the major elements in the development of the cooperative movement in fluid-milk marketing was the feeling on the part of producers that distributors were taking an unfair advantage of them in such matters as prices, weights, and tests, and that there was no assurance of having an outlet for their milk at all times. Many consumers cannot understand why they are charged so much more for milk than the farmer receives, why there is so much overlapping and duplication in service; in short, the feeling exists that milk distributors are less efficient than should be the case. Also, reference is frequently made to the large profits of milk dealers, the idea being rather frequently expressed that

⁵⁰ This calculation ignores any decrease in the amount taken by consumers at the increased price. See ch. 3 for a discussion of the nature of the demand for milk.

⁵¹ From the standpoint of social policy, however, the Government might deem it advisable to subsidize production or consumption.

milk-dealers' profits are too large on account of a presumed high degree of monopoly. Perhaps the latter is due in large part to the suspicion with which many people view the operation of large-scale firms—the "trust" complex.

Whatever the reasons, the fact remains that there has been a phenomenal growth in the volume of legislation pointed to regulation of the milk trade in recent years, the legislation taking the form of price regulation, in contrast to the previous regulations relating to milk sanitation.

At the present time, about 18 States and the Federal Government have laws which authorize the regulation of prices. Most of these laws are pointed directly to the regulation of prices, the State laws usually giving the State power to fix both minimum prices to be paid producers and the prices at which distributors may sell milk.

In a previous section of this chapter the type of market that would be desirable from the standpoint of the public interest was postulated. The question then becomes one of ascertaining how this desired market can be secured. Several lines of activity that could be undertaken in answer to this question are as follows:

(1) Endeavor to so reorganize the market structure for milk that milk prices would be determined under conditions of simple competition.

(2) Discontinue all regulatory measures pertaining directly to milk prices. This really means a reversion to the status existing prior to recent governmental price regulation.

(3) Maintain present regulatory policy, revising the existing regulatory laws as experience in their operation indicates.

(4) Develop a still higher degree of centralization of the milk business under public regulation, such as:

(a) Monopolies granted to private firms.

(b) Publicly owned and operated monopolies.

Some considerations of the possibilities of each of these suggestions will be set forth in the following sections of this chapter. The authors do not intend to set forth their ideas regarding the approach that should be taken to the problem, but merely intend to discuss the possibilities of each approach.

II. SUGGESTIONS FOR IMPROVING CONDITIONS IN THE MILK TRADE

1. **Reorganization of the market structure so that prices would be determined under conditions of simple competition.**—It is frequently asserted that prices, not only of milk but of all other commodities, except perhaps the output of industries recognized as public utilities, should be determined under competitive conditions. It is somewhat difficult to ascertain just what this proposal means or is intended to mean by those who make it. To some it probably means breaking up alleged collusive activities of large operators. Perhaps this is what the layman intends by such a proposal. This also appears to be the idea in most of the political attacks against size, the feeling that in the matter of mere size there is something inherent that is inimical to the public welfare.⁵² This may very well be the case, but the point often overlooked is that collusion is not at all necessary for

⁵² Court interpretations have been largely pointed toward breaking up collusive activities in restraint of trade, or practices that are interpreted to be in restraint of trade whether or not collusion figures in such practices. Mere size is ordinarily not construed as prima-facie evidence of monopolistic practices by the courts. However, it appears that the courts in their decisions regarding trade-marks and brands have erred seriously, as a matter of fact, in rendering decisions which they thought implemented competitive conditions but which actually preserved monopoly elements in trade. See Chamberlin, Edward, *Theory of Monopolistic Competition*, appendix E, for a penetrating discussion of this matter.

the price structure of many commodities to be determined under conditions of complex competition. Collusion probably implements the monopoly elements inherent in large-scale organization and operation, but has probably been overstressed in most of the thinking about and the investigation of, so-called trusts. The statement probably carries different connotations to different economists, depending upon their training and experience. One large group probably uses the term as descriptive of a system where competition is "free" and "unrestrained", viewing prices as determined more or less mechanistically by the law of supply and demand when the number of buyers and sellers is large, that is, under conditions of simple competition. The latter is the interpretation of the term as used in this connection in this chapter. Stated differently, the often-expressed urge that the price structure be determined under competitive conditions is interpreted to mean that the proponents of this idea urge a return to conditions of simple competition, i. e., conditions under which prices are determined through the more or less mechanistic action of the economic forces of supply and demand, and under which the number of buyers and sellers in any particular market is so large that the purchases of the one, or the amount supplied by the other, represents an insignificant portion of the trading in the market, and under which the products of all sellers are strictly homogeneous. If, then, the urge that the price structure revert to one determined under conditions of simple competition were to be realized, what would have to be done?

It has been adequately demonstrated that, so far as the distributive phase of the milk business is concerned, conditions exist which point definitely to the conclusion that milk distributors operate under conditions of complex competition. If, then, the price of milk is to be determined under conditions of simple competition, if there is to be "free" competition, it appears that it would be necessary to eliminate large distributors. Further, it would be necessary to eliminate all product differentiation, brands, trade-marks, the real or fancied differences in the product itself, and the preference for the product of particular dealers based on what might be called personal attributes of the dealers, their service, credit policies, etc. If this were done, presumably the price of milk would be determined under conditions of simple competition and, as far as the distributive enterprise is concerned, competition would be "free."

The nature of the change involved in the milk distributive enterprise if the price of milk were to be determined under conditions of simple competition having been set forth, attention is now focused upon the problem from the standpoint of producers. It was pointed out in chapter 2 that in many cities, certainly in practically all large cities, significant groups of producers are organized into cooperative associations which act as sales agents for producer members. It was shown that in many cases these associations have control of a significant portion of the total supply readily available to distributors. Thus, although the actual production of the milk supply of a large city is carried on by a multitude of small producers, as far as the sale of milk to distributors is concerned a significant portion of the supply is sold by one firm or organization, the cooperative association. The classified-price plan of selling milk to distributors, and the various plans of prorating among member producers the proceeds of sales to distributors, were shown to be an attribute of this large-scale organi-

zation of the supply of the raw material, that is, one of the attributes of the milk trade that is of complex, rather than simple, competitive character. If one follows the line of argument advanced with respect to distribution, it would be necessary to markedly curtail the price-making activities of cooperative associations of producers, perhaps eliminate them, if the milk-price structure were to be determined under conditions of simple competition.

Thus it should be evident that in order for milk prices to be determined under conditions of simple competition, for competition to be "free", it would be necessary to eliminate large distributors, all differentiation of the product, and producer cooperative associations, at least the price-making activities of the latter. It is highly probable that the proponents of a return to simple competition fail to realize all of the factors involved in this connection. Certainly few if any of them have publicly advocated the dissolution of producer cooperatives, yet if their position is to be consistent throughout they must also follow through and outline the corrective measures which must be taken, which appear to be the three lines of activity noted above.

Actually, it is highly probable that the determination of milk prices, under conditions of simple competition, is not in the public interest but antithetical to it. Firms usually grow in size and power because of efficiency of operation; they are probably able, at least during the period of their development, to operate more efficiently than their competitors. Of course, large financial resources may enable an operator to differentiate his product to an appreciable degree, thereby turning his customers' attention away from prices and more or less stultifying price competition. However, the fact that large-scale distribution units developed is strong *prima-facie* evidence that, at least during the period of their development, these large-scale units were able to operate more efficiently and capture the business of competitors. Hence the proposal that the price of milk be determined under conditions of simple competition, that competition in the milk trade be "free", needs to be carefully weighed. The caution that should be exercised regarding this proposal becomes manifest when one endeavors to imagine what conditions of simple competition would necessitate in relation to milk distribution. It would be extremely difficult for the market for milk to be one where large numbers of buyers and sellers meet and negotiate their trades. The closest approach to such a market is an auction market, or a market which, as far as pricing is concerned, operates much the same as the grain trade, where prices are established from day to day on the basis of the prices that rule on the grain exchanges. For a product such as milk, highly perishable and needing relatively rapid handling between producer and consumer, the possibilities of developing an exchange market such as exists for some other agricultural products seem so limited that further discussion of the matter would be merely idle speculation.

It may appear that a peddler system of selling milk would be a closer approach to the conditions of simple competition than the present system. However, the peddler system would have to operate in such fashion that there would be random association of buyers and sellers, and it is highly improbable that this would be the case. What probably happens in markets where peddlers operate is that sooner or later the peddlers develop rather well-defined routes and their product becomes differentiated. Even though they may sell for

less than the usual market price, their prices are probably established at some fixed differential in relation to the price prevailing generally in the market, in which case the prices at which they sell from day to day do not vary in response to variations in demand and supply.

Next, consider the case of large numbers of small dealers. There is no good reason to believe that even then prices would be determined under conditions of simple competition. Milk is usually delivered in the early morning, before the city streets become congested with traffic and before the larger portion of the customers are stirring. If milk is to continue to be delivered under these circumstances, and not hawked through the streets (in which case the requirements for the establishment of prices under conditions of simple competition probably are not fully met), it is highly probable that customers would tend to become associated with dealers on a selective basis, each small dealer would have his own routes, and price competition, at least on a seasonal basis, would probably be no different than it is at the present time, with a few large dealers handling most of the volume in markets of any appreciable size and the remainder divided up among a number of small dealers. In any case, experience with markets wherein a large number of producer-distributors operate indicates that prices are quite rigid, certainly on a seasonal basis. Stated differently, producer-distributors practice interenterprise diversion the same as regular distributors, and do not cut prices during the flush production period in order to move the seasonally heavy supplies into consumption as fluid milk. Also, some producer-distributors practice relatively more product differentiation than regular distributors, gaining their trade on the basis of claims of high quality or superior service, although this must not be taken to mean that such practices on the part of producer-distributors are general in character. A great deal more study needs to be devoted to the methods used by the producer-distributors in gaining business.

Thus it appears that, although the phrase "free competition" has a satisfying ring, when the reorganization of our economic structure necessary to secure "free competition" is considered, the subject becomes one that needs to be approached with a great deal of trepidation. As far as milk is concerned, it is extremely difficult to imagine what the market structure would be if milk prices were to be determined under conditions of simple competition. As was pointed out before, in order to change the market structure so that milk prices would be determined under conditions of simple competition it would be necessary to (1) break up large distributing concerns, (2) forbid all differentiation of the product, and (3) outlaw the price-making activities of cooperatives, which, as far as bargaining cooperatives are concerned, would amount to their dissolution. Furthermore, it is questionable whether the price of milk would be any lower than under the present system, and, as a matter of fact, it might very readily be considerably higher. Thus, when its many ramifications and uncertainties are considered, there seems little reason to consider further the possibilities of making the market structure one in which milk prices are determined under conditions of simple competition. Analyzed from the point of view of the "corrective" measures that would have to be applied in order that the goal of simple, or "free", competition might be secured, the proposal appears to be radical in the extreme.

2. Discontinuation of Government interference in the milk trade, with special reference to prices.—Perhaps some proponents of free competition in the milk trade have in mind the removal of all so-called "Government interference" in milk prices, a return to conditions existing prior to 1933. Governmental regulation of the quality of milk is probably not considered in this connection, the bone of contention being whether the Government, either State or Federal, has or should have any influence in regulating the handling of milk, with special reference to the regulation of prices and terms of sale. The proposition, in reality, is one of reinstating the practice existing prior to 1933 and letting the price of milk be determined under conditions then existing as far as the structure of the market is concerned, and which, for that matter, still exist in a large number of markets.

As has been shown, the milk-price structure in most large milk markets has been determined for many years under conditions of complex competition as far as the distribution end of the business is concerned, and under conditions of complex competition with respect to the sale of milk to distributors since the development of large-scale bargaining associations of milk producers. Under these conditions the removal of State and Federal regulation merely means that the price of milk to producers and consumers would be determined without any policing whatever in regard to prices, except perhaps sporadically under the antitrust laws. The question of the effectiveness of the present regulatory laws in securing a stable volume of milk at reasonable prices is not of moment here. The intent is to show that removal of present regulatory measures, without any measures to take their place, means that milk prices would, as before, be determined by the play of economic forces operating under conditions of complex competition, with marked opportunity for activity inimical to the public interest. The core of the argument in favor of this procedure would seem to be that milk prices prior to regulation were determined in such fashion that the public secured its milk at its minimum supply price, i. e., at the point of most efficient operation with respect to milk production and distribution; or, if inefficiency existed, in the sense that firms operated at some point above their minimum cost point, that it would be better to let the industry alone rather than try to improve it.

The pricing system under conditions existing prior to price regulation resulted in a high degree of rigidity in pricing (see ch. 4), price changes (to consumers) rarely taking place except in times of major economic stress and even then being subject to a rather marked lag. As is pointed out in the following section, the failure to adjust prices rapidly to changing economic conditions results in an increase in capacity that is not needed. Also, the pricing system is such that, even under conditions of relative stability, excess capacity may well be a normal function of the industry. All of the foregoing merely points to the conclusion that there is a rather marked lack of price competition in milk markets, especially in regard to retail prices, with the strong possibility that such lack may be inimical to the public interest. This statement may appear strange in view of the attention which has been given to the activities of the "chiseler", but it has been reasonably well demonstrated that positive price competition on a seasonal basis does not exist in milk markets, and the preponderance of evidence seems to indicate that it may not exist to an appreciable

degree in milk markets for periods of several years at a time.⁵³ Whenever price competition does not exist to any appreciable degree there are strong reasons for believing that the price of milk may be placed at a level that will not be associated with efficient operation, and that certain activities associated with enhancing profits on some basis other than efficiency of operation may exist.

Perhaps the major reason for concern, if one is interested in the public welfare, is that the pricing system is not out in the open under conditions that normally exist in milk markets. The cooperatives' major effort has been to establish uniform pricing on a use basis, but in many cases their efforts have been more or less stultified by inability to control enough of the milk to make their established prices uniform for the market as a whole, or by the failure of the distributors cooperating with them to allow entry to books and records on a basis sufficient to accurately check sales by distributors, data which are essential to the proper functioning of any classified price plan.

Unless cooperatives are able to audit the sales records of distributors who purchase their milk, they are practically powerless in the development of a program pointed to uniform prices. If a distributor does not properly report his sales use he stands to gain in comparison with a distributor who properly reports his sales, inasmuch as he would undoubtedly secure his milk at a lower price than other distributors who do not follow this procedure.⁵⁴

The practice of underpayment, in the sense of improper accounting so that milk is secured at lower cost than it should be on the basis of the class prices specified in the selling plan, is merely a method of making a hidden price cut. Specified class prices are not reduced but an actual reduction in the cost of milk is obtained by improper accounting. The major criticism of such a practice would seem to be that it tends to stultify any scheme of uniform pricing. Inasmuch as it is highly probable that distributors who follow this practice do not follow it to the same degree, it follows that it is highly improbable that distributors obtain their milk for the same price according to use. Hence the gains a distributor who practices improper accounting makes as a result of such practices are not the result of efficiency of operation in terms of output per unit of input. This practice may thus operate so that inefficient operators, who would tend to be eliminated if there were uniform buying prices and an appreciable degree of competition among distributors, continue to operate in the market, thus tending to increase the amount of distributive services, with resultant further duplication of services and failure to secure efficiency of plant operation and milk distribution for the market. On the other hand, this practice may have its desirable points, as far as the public welfare is concerned. If nominal class prices that are established appear to have an appreciable arbitrary element, the practice of improper accounting, being in the nature of a price cut, though hidden, may actually result in the elimination of part of or perhaps all of the arbitrary element in the class prices. However that

⁵³ Positive price competition is here used in the sense of price competition strong enough to cause frequent changes in prices to consumers in view of changes in demand and in supplies produced, rather than in supplies offered to consumers.

⁵⁴ Concrete examples of the matter of underpayment of producers selling milk to distributors on the basis of a classified-price plan have been secured by the Federal Trade Commission in its investigation of milk markets under H. Con. Res. No. 32, 73d Cong., 2d sess. See Federal Trade Commission, H. Doc. No. 152, 74th Cong., 1st sess., pp. 74-75.

may be, the necessity of having to resort to such a practice in order to eliminate the arbitrary element that may be found to exist in class prices is certainly an unfavorable reflection upon the factors operating in the market. If, however, there is no element of arbitrary pricing in the class prices established, it is difficult to see how such practice is other than inimical to the public interest.

The foregoing part of this section deals with the practice of improper accounting of milk sales use when all dealers are operating under a classified-price plan of purchasing their milk. However, it is very seldom that all distributors will be found to be purchasing their milk supplies in accordance with a classified-price plan in any particular market. The Dairy Section of the Agricultural Adjustment Administration did not find a single market, out of a total of 52 for which licenses or orders were issued at one time or another, in which the classified-price plan of purchase was followed by all distributors in the market. In addition, numerous markets other than those for which licenses and orders were issued have reported to the Dairy Section at one time or another, and in no case were all distributors in the market purchasing their milk supplies on the basis of the classified-price plan then in operation in the market. This situation leaves the way open for distributors not operating under the plan to obtain their milk supplies at a lower price than distributors operating under the plan, and hence to compete on the basis of securing a cheap supply of milk in comparison with their competitors, rather than on the basis of efficiency of operation, measured in terms of output per unit of input. This can be understood readily by reference to the hypothetical illustration set forth below.

Assume that distributors purchasing their supplies from the cooperative sell 10,000 hundredweight in the class I use and 3,000 hundredweight in the class II use. Assume further that the class prices established are \$2 per hundredweight for milk sold as class I milk and \$1 per hundredweight for class II milk. Thus such distributors' milk costs them a total of \$23,000, of which the cost of class I milk amounts to \$20,000 and the cost of class II amounts to \$3,000, the weighted average price amounting to \$1.77 per hundredweight.

Now any distributor who utilizes as class I relatively more of his milk than the average proportion of total receipts so utilized by distributors purchasing their supplies from the cooperative, on the basis of a classified-price plan of purchase, can secure his milk supply more cheaply than if he purchased his supply on the basis of the classified-price plan.

For example, assume distributor X sells 1,000 hundredweight as class I and 100 hundredweight as class II. The total cost of this distributor's purchases, if purchased under the classified-price plan, would be \$2,100, amounting to \$1.91 per hundredweight of milk received. Distributor X, by purchasing his supplies on a flat-price basis, can secure an advantage over distributors with the same utilization who purchase their supplies on the basis of a classified-price plan, the advantage amounting to a part or all of the difference between the blended price received by producers who sell their milk on the basis of a classified price plan and the cost of \$1.91 per hundredweight incurred by the distributor who has the same utilization as distributor X but purchases his supplies on the basis of the classified price plan.

This advantage of the flat-price buyer over the distributor purchasing on the basis of a classified-price plan is larger or smaller,

according to the utilization of the flat-price buyer as compared to that of his competitors and the size of the differential between the specified class I price and the blended price received by producers.

Of course, the corollary to this is that producers who sell to the distributor who buys on a flat-price basis gain by the amount which such distributor pays them in excess of what they would receive if their milk were pooled with the milk of the other producers in the market. However, it is highly improbable that their milk differs from the milk of other producers to any appreciable degree; hence, the gains they make by selling to flat-price buyers are not necessarily a function of some factor that makes their milk more desirable but is probably largely a function of the practice of flat-price buying by the distributor to whom they sell. Stated differently, it is highly probable that there is little economic justification for such producers to receive higher prices than other producers, assuming a proper plan of prorating among producers the proceeds of sales to distributors.⁵⁵ An important reason they are able to do so is undoubtedly the fact that the effort of other producers in the market to arrive at a system of uniform pricing brings into being the conditions under which the noncooperating producer can secure gains over other producers who cooperate in establishing a uniform selling plan. Under such conditions the gains of the noncooperator who stays outside the plan and sells to flat-price buyers are largely a function of the practices that can be indulged in by distributors who buy on a flat-price basis.⁵⁶

The Federal Trade Commission states: "As previously pointed out, the flat-price buyer who usually sells milk only for consumption as fluid milk will offer to purchase from producers at a price which is a trifle higher than the prevailing blended prices they are receiving from other dealers purchasing on a utilization basis. As he disposes of nearly all his milk in fluid form as class I, he profits by the fact that, although he buys at only slightly higher than the blended price paid by other distributors on a utilization basis for classes I, II, and III, he sells nearly all which he purchases at the high class I price. The following table shows the profit obtained in 1 month by certain dealers from paying for milk on the flat-price basis instead of on the basis of their actual utilization:

	Number of distributors	Profit gained by buying on flat-price basis instead of on utilization basis	
		Per quart	Total
		<i>Cents</i>	<i>Dollars</i>
Connecticut ¹	6	0.867	6,648.61
Philadelphia ²	3	.993	4,045.84
Total.....	9	.911	10,694.45

¹ For month of June 1934.

² For month of October 1934.

⁵⁵ See ch. 6.

⁵⁶ "Under the flat-price plan the distributor agrees to pay the producer a given price for all milk purchased. A common practice of flat-price buyers is to offer farmers a slightly higher price for all of their milk than the average price they have been receiving from a dealer who buys on a utilization basis. The flat-price buyer generally tries to limit his purchases to a quantity practically equal to his fluid-milk sales. The farmers being offered a higher price per unit are, of course, generally glad to sell to a flat-price buyer. It should be understood, however, that if the flat-price buyer paid the farmers on the basis of his utilization, which is practically all class I, he would have to pay a much higher price than that which he actually does pay." Federal Trade Commission, H. Doc. No. 152, 74th Cong., 1st sess., p. 29.

"* * * The table, therefore, shows the amount of underpayment to farmers through failure of these dealers to pay the price based upon their own utilization of their own milk purchases as required by the board rules. One of the important effects of this practice is that the ability to purchase milk at the relatively low blended prices being paid by other distributors puts the flat-price buyer in a very advantageous position to cut prices on milk to the wholesale and retail trade." ⁵⁷

As was noted previously, the advantage of the flat-price buyer increases as the differential between the specified class I price and the blended price received by producers increases. In this connection the findings of the Federal Trade Commission in regard to Connecticut markets are of interest.

"This wide difference between the price of milk sold for consumption in fluid form and the blended price tended to make it advantageous for flat-price buyers to operate in this milk shed. In other words, these flat-price buyers were able to offer producers a price slightly in excess of the blended price prevailing in that territory (Connecticut). As such dealers tend to have a higher proportion of their sales in class I, the gross margin which they obtain on all milk sold tends to be larger than that enjoyed by the distributors who buy on a utilization basis. This advantage in gross profit margin makes it possible for the flat-price dealer, if he is so inclined, to cut prices and thus disturb conditions in the market." ⁵⁸

Another element in the milk-price structure that is subject to certain so-called "abuses" and leads to nonuniformity in milk prices is the matter of country-station allowances. In the larger milk markets, where distributors have to reach out long distances in order to secure a supply of milk, it is often found that the milk will be assembled at distant points at receiving stations where it is generally weighed, tested, cooled, and shipped to the city in carload lots, tank trucks, or railroad tank cars. Thus some of the functions of the city plant, such as the general category of services known as receiving, weighing, testing, cooling and standardizing, may be performed at plants located some distance from the city. Also, this type of operation makes it possible to bring together in one place a volume of milk of sufficient magnitude so that it can be shipped at carload rates, rather than at less-than-carload rates. However, there is some milk in larger markets that is shipped direct to city plants from producers' farms at less-than-carlot rates. Under such conditions the problem of establishing uniform prices f. o. b. city and paying producers on the basis of these prices, subject to adjustments for receiving station and transportation expenses, becomes rather complicated, since it will generally be found that certain distributors, usually the larger ones, own and operate receiving stations while the smaller distributors do not.

It would appear that the price which must be paid f. o. b. city in order that any given volume of milk be forthcoming is that just necessary to call forth the marginal increment in the supply, since any price higher or lower than this would be associated with larger or smaller supplies of milk f. o. b. city, as the case may be. The price of milk f. o. b. the city must, of course, cover the cost of transportation and other costs incurred in bringing the milk to the city, and leave

⁵⁷ *Ibid.*, p. 76.

⁵⁸ Federal Trade Commission, H. Doc. No. 387, 74th Cong., 2d sess., pp. 37-38. Compare the statements quoted with the general theory set forth in chs. 5 and 6.

enough for the farmer to enable him to keep producing the desired volume. Now the marginal increment of the supply is the most expensive increment, under conditions of increasing supply price, as far as production is concerned, and, of course, the total cost of transporting a unit of product increases as the distance from the market increases, other factors being the same. Thus, as far as the milk business is concerned the supply price of a given volume of milk must be sufficient to cover the farm price of the marginal increment of supply, plus enough to cover the cost of bringing milk to the city. Over a period of time it might be expected that all of the milk would tend to be collected and transported to the city by the method that resulted in the lowest cost, whether collected at a country receiving station and shipped to the city in carload lots or shipped direct from producers' farms to the city at less-than-carlot rates. However, it is probably less expensive to ship milk direct from producers' farms to the city from nearby sources than it is to go to the expense of gathering such milk at a country receiving station and ship it to the city in carlots at the carlot rate. At some distance from the market, however, the savings secured through shipping at the carlot rate will be enough to offset or more than offset the additional cost of developing country receiving station facilities. Available evidence seems to indicate that tank-car and tank-truck shipment has largely supplanted direct shipment at less-than-carlot rates in many large milk markets. However, a distributor who is able to develop economical sources of supply, other factors being the same, has an advantage over a distributor who is not able to develop such economical sources. Hence, such a distributor, other factors being the same, will tend to secure a wider gross margin than the distributor not so situated, which may show up as "profit" on the operation of his country stations or in other ways, depending upon how he keeps his accounts. Thus, if a distributor who operates country stations and transports his milk in carload lots has an advantage over the distributor who receives his supplies direct-shipped from producers' farms at less-than-carlot rates, he is in a position to ship his milk at carlot rates and deduct the less-than-carlot rate from producers, since, *ex hypothesi*, the producer selling to such distributor can secure no more than f. o. b. city prices less the less-than-carlot rate by shifting to the distributor who receives his milk at the city direct from producers' farms.

Subject to the qualifications set forth above, attention is now directed to the matter of country station and transportation allowances that are deducted from prices f. o. b. the city. In many cases the producers' cooperative bargains not only for class prices f. o. b. the city but for the deductions that are made from such prices. Thus, it may be able to secure certain increases in prices f. o. b. city, but unless the problem is carefully handled it may find part or perhaps all of the increase offset by increased deductions from such prices made by distributors.

The problem of setting up proper country station deductions is quite difficult. If it is deemed advisable to set them up on the basis of cost, the question then becomes one of ascertaining what cost, weighted average, modal, highest, lowest, etc. Costs vary markedly between stations, the variance depending upon the volume of milk going through the stations and upon other factors.⁵⁹ Cooperatives

⁵⁹ Federal Trade Commission, H. Doc. No. 387, 74th Cong., 2d sess., p. 31.

have usually handled this question by bargaining for a specified deduction for milk going through country stations. Just what factors the cooperatives and distributors consider in arriving at the allowance for country station charges are not clear, but it should be evident that distributors operating country stations may earn a profit on such operations, which, other factors being the same, may give them a competitive advantage over other operators. However, the mere fact that distributors may make such a profit does not appear reprehensible, unless the profit is due to securing an arbitrary country station allowance.

Subject to the reservations set forth in the preceding pages, attention is now turned to the practice employed by some distributors of shipping milk from country stations to the city in carload lots at carlot rates and deducting the higher less-than-carlot rates from their payments to producers. Data regarding this point are not available for many markets, but there is some reason to believe that the practice may be widespread in large milk markets. The Federal Trade Commission found this practice to be rather widespread in the Philadelphia market.

"Although the freight rate deducted from producers is the less-than-carload rate, most of the milk is as stated actually shipped at carload rates, or, if by tank truck, in large quantities and presumably at less cost than if handled in the cans of each individual producer. The distributors claim that while there apparently is a profit to them in the difference between the carlot and less-than-carlot rates, their costs absorb practically all of this difference. The facts are, however, that the charges for hauling levied against producers do result in a profit to distributors. * * *⁶⁰

Also, "Such milk hauling profits were available only to the larger distributors having country stations. Smaller distributors had to pay the established f. o. b. price for milk, if they were to operate under the established milk settlement plan."⁶¹ The Commission states as its opinion that the practice of distributors of shipping milk at the carlot rate and deducting the higher less-than-carlot rate from returns to producers should be discontinued.⁶² Of course, if competition between distributors in the purchase of milk from producers were strong, it is improbable that this type of profit would long obtain, since competition among distributors would result in the prices paid producers reflecting the carlot rather than the less-than-carlot rate. However, under conditions of complex competition it is not at all implausible to believe that the practice in question may continue for a considerable period of time, and the fact that distributors are able to "traffic" in freight rates in this fashion indicates a large degree of stultification of competition. Since these gains are not due to efficiency of operation as such, except insofar as large-scale organization and operation may enable some distributor to secure a large share of the market and place him in a position to indulge in this practice, the practice from which these gains result appears to be inimical to the public welfare, *prima facie* at any rate. While it may be argued that, if distributors did not secure these gains in country station and transportation charges, it would be necessary to increase the spread between prices paid producers f. o. b. city and prices paid by consumers, it would appear

⁶⁰ *Ibid.*, p. 34.

⁶¹ *Ibid.*, p. 37.

⁶² *Ibid.*, p. 4.

to be more reasonable to follow the latter procedure, since the practice of trafficking in freight rates and making adjustments for country station charges that are arbitrary is in the nature of a hidden price cut, subject to the same objections as any hidden price cut that results in the stultification of uniform pricing and gives certain elements in the trade advantages not very readily justifiable from the economic standpoint.

The possibilities of practices pertaining to arbitrary pricing and the discriminatory uses to which the various plans of prorating among producers the proceeds of sales to distributors may be put have been set forth in some detail in chapters 5 and 6, so that there is no need to go into detail at this point in regard to these practices. Suffice it to say that arbitrary pricing and the use of proration plans in such manner that price competition is stultified to a greater or lesser degree are, *prima facie*, not in the interest of the public, and in any case it is difficult to see clearly how such practices could be other than opposite to the public welfare.

Thus, to go back to the system that prevailed prior to regulation, and which still largely prevails for that matter, appears to amount to the proposition that the milk trade, which has been shown to be subject to practices that are not demonstrably relevant to securing efficiency in the milk-marketing system, be subject to no regulation or policing relative to prices.

3. **The labor problem.**—Another problem that needs to be considered in an analysis of the price structure for milk is the labor problem. Labor cost is a very important part of total operating expenses and of the gross margin of distributors (selling price of the finished product less cost of raw material). Information secured by the Federal Trade Commission in an investigation of milk marketing in Connecticut cities and Philadelphia, Pa., indicates that in most cases labor cost constituted more than 50 percent of total operating expense. In 1933 labor cost amounted to 52.4 percent of the total operating expense incurred by three large Connecticut distributors and 48.2 percent of the total operating expense incurred by six smaller Connecticut companies. In the same year 58.9 percent of the total operating expense of two large Philadelphia distributors was represented by labor cost, and the comparable figure for three smaller Philadelphia companies was 54.4 percent. (See table 41.)

TABLE 41.—*Percentage of labor cost to total operating expenses for specified Connecticut and Philadelphia milk distributors, 1931-33*

	Percent of labor to total operating expense		
	1931	1932	1933
CONNECTICUT			
Larger companies:			
1.....	43.5	47.6	46.3
2.....	58.8	57.3	54.9
3.....	53.1	55.1	53.0
Total.....	53.4	54.4	52.4
Smaller companies:			
1.....	47.3	45.5	39.8
2.....	53.1	49.6	48.6
3.....	53.5	49.1	45.2
4.....	45.4	46.8	46.1
5.....	59.3	54.5	58.4
6.....	45.0	46.0	64.0
Total.....	50.6	48.5	48.2
Total all companies.....	52.8	52.8	51.2
PHILADELPHIA			
Larger companies:			
1.....	54.8	55.2	54.7
2.....	65.3	66.3	63.8
Total.....	59.0	59.9	58.9
Smaller companies:			
1.....	56.9	57.5	55.9
2.....	50.8	47.7	51.0
3.....	60.6	57.8	55.5
Total.....	56.7	55.0	54.4
Total all companies.....	58.9	59.6	58.6

Compiled from report of the Federal Trade Commission, H. Doc. No. 387, 74th Cong., 2d sess., p. 120.

In 1933 a group of six Milwaukee, Wis., distributors, composed of two large, two intermediate, and two small distributors, considered to be representative of their respective size groups, showed a gross operating margin of 3.193 cents per quart of milk receipts. Of this sum 1.979 cents, or about 62 percent, was expended for labor, including processing, delivery, selling, and general and administrative labor. (See table 42.) These figures probably are more important than indicated above on the basis of receipts, since the companies converted a considerable portion of the volume of milk they received into manufactured dairy products, the latter generally requiring relatively less labor than the fluid-milk enterprise.

TABLE 42.—*Profit and loss statements of 6 selected distributors in Milwaukee, Wis., 1933*

	2 large companies		2 intermediate companies		2 small companies		Average 6 companies	
	Per quart of receipts	Percent of total	Per quart of receipts	Percent of total	Per quart of receipts	Percent of total	Per quart of receipts	Percent of total
Processing expense:	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Labor.....	0.409	12.4	0.456	17.5	0.570	15.9	0.415	12.8
Power and refrigeration.....	.177	5.4	.094	3.6	.176	4.9	.170	5.3
Repairs.....	.052	1.6	.040	1.6	.102	2.9	.051	1.6
Depreciation.....	.071	2.2	.092	3.5	.122	3.4	.073	2.3
Taxes and rent.....	.027	.8	.025	1.0	.109	3.0	.028	.9
Insurance.....	.009	.3	.025	1.0	.009	.3	.011	.3
Auto expense.....	.019	.6	—	—	—	—	.016	.5
Cartons, boxes, barrels, etc.....	.163	5.0	.024	.9	.046	1.3	.151	4.7
Bottle caps, wire, etc.....	.029	.9	.019	.7	.030	.8	.028	.9
Bottles.....	.021	.6	.033	1.3	.036	1.0	.023	.7
Supplies.....	.033	1.0	.042	1.6	.072	2.0	.034	1.0
Miscellaneous.....	.014	.4	.026	1.0	.034	1.0	.014	.4
Total.....	1.024	31.2	.876	33.7	1.306	36.5	1.014	31.4
Delivery expense:								
Salaries, wages, and commissions.....	1.369	41.6	.979	37.6	1.129	31.5	1.335	41.3
Feeding and bedding.....	.046	1.4	.040	1.5	—	—	.045	1.4
Horse shoeing.....	.026	.8	.021	.8	—	—	.025	.8
Gas, oils, tires, and tubes.....	.043	1.3	.084	3.2	.403	11.3	.049	1.5
Repairs.....	.087	2.6	.066	2.5	.191	5.3	.086	2.7
Depreciation.....	.116	3.5	.081	3.1	.106	3.0	.113	3.5
Lights, power, refrigeration, and water.....	.015	.5	—	—	—	—	.014	.4
Freight, cartage, and express.....	.039	1.2	—	—	—	—	.035	1.1
Breakage and waste.....	.024	.7	—	—	—	—	.022	.7
Taxes and rent.....	.036	1.1	.005	.2	.036	1.0	.033	1.0
Office expense and stationery.....	.010	.3	—	—	—	—	.010	.3
Insurance.....	.033	1.0	.035	1.4	.024	.7	.033	1.0
Licenses.....	.004	.1	.004	.2	.021	.6	.004	.1
Miscellaneous.....	.027	.8	.003	.1	—	—	.025	.8
Total.....	1.875	57.0	1.318	50.6	1.910	53.4	1.829	56.6
Selling expense:								
Salaries and commissions.....	.074	2.2	.024	.9	—	—	.069	2.1
Telephone and telegraph.....	.005	.1	—	—	—	—	.004	.1
Stationery, printing, and postage.....	.009	.3	—	—	—	—	.008	.2
Auto expense.....	.006	.2	—	—	—	—	.005	.2
Advertising.....	.065	2.0	.062	2.4	.027	.8	.064	2.0
Credit and collections.....	.012	.4	—	—	—	—	.011	.3
Subscriptions and dues.....	.002	.1	—	—	—	—	.002	.1
Miscellaneous.....	.001	(¹)	—	—	—	—	.002	.1
Total.....	.174	5.3	.086	3.3	.027	.8	.165	5.1
General and administrative expense:								
Salaries.....	.150	4.6	.265	10.2	.258	7.2	.160	4.9
Telephone and telegraph.....	.003	.1	.006	.2	.020	.6	.003	.1
Stationery, printing, and postage.....	.008	.2	.018	.7	.026	.7	.009	.3
Traveling expense.....	.001	(¹)	(²)	—	—	—	.001	(¹)
Auto expense.....	.001	(¹)	—	—	—	—	.001	(¹)
Professional services.....	.010	.3	.003	.1	—	—	.010	.3
Subscriptions and dues.....	.001	(¹)	—	—	—	—	.001	(¹)
Taxes and rent.....	.003	.1	—	—	.009	.2	.003	.1
Light and heat.....	.001	(¹)	—	—	—	—	.001	(¹)
Depreciation.....	.005	.2	.003	.1	.002	.1	.005	.2
Miscellaneous.....	.032	1.0	.027	1.1	.019	.5	.031	1.0
Total.....	.215	6.5	3.22	12.4	.334	9.3	.225	6.9
Total operating expense.....	3.288	—	2.602	—	3.577	—	3.233	—

¹ Less than one-tenth of 1 percent.² Less than 0.001 cent per quart of receipts.

Compiled from A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

Christenson, in a study of wages and hours in the dairy industry, undertaken when a proposed code for dairy industry labor under the National Recovery Act was under consideration, found that in 1933 aggregate pay rolls amounted to 27.9 percent and 22.6 percent of sales by class A (specialized milk dealers), and class B (dairy manufacturers with milk departments), respectively.⁶³

The foregoing figures serve to indicate in a general way the importance of labor costs in the milk trade. There is a decided lack of employment statistics relating to the dairy industry, which makes it exceedingly difficult to treat this subject as fully as would be desirable.

For the purposes of this treatise, labor costs are important insofar as they may affect (1) the rigidity of milk prices and (2) the competitive aspects of the milk trade.

It is fairly well recognized that labor unions occupy an important place in bargaining for wages and in representing members with respect to working conditions in many industries. This is true in the milk industry. In many important markets there are strong labor unions representing members in wage bargaining and in other ways. Whether milk prices will tend to be adjusted rapidly to changing economic conditions will depend in part upon the adjustments made in wages. For example, if conditions such as those prevailing during the depression appear to indicate a reduction in selling prices to consumers, the reduction may be expedited by an adjustment of wages, especially the wages and commissions paid delivery men (this being the largest portion of total labor cost), or may tend to be prevented by the failure to adjust wages downward. Under the latter circumstances distributors will probably endeavor to reduce their wage bill by consolidating routes, by having their laborers work longer hours, and by other methods. However, there may be serious consequences to the distributor if the discharged route men become peddlers.

During the period 1929-34 there appears to have been some reduction in the number of employees in the milk trade. In 1934 specialized milk dealers (identical plant basis) employed 97.1 percent as many route men and 92.3 percent as many plant men as in 1929. Dairy manufacturers with milk departments employed 94.5 percent and 94.2 percent as many route men and plant employees, respectively, in 1934 as in 1929.⁶⁴ From this it appears that the level of employment was fairly well maintained during the depression as far as route men were concerned, with a relatively less favorable position shown with respect to plant employees. There also appears to have been some reduction in the average hours worked per week during this period.

Christenson states that "Moreover, in spite of the fact of some shrinkage in the dollar value of sales from routes during the years since 1929, and of the widespread custom of at least partial remuneration of the route employees on a commission basis, the average weekly earnings of route men, both in 1933 and in 1934, were maintained very near the level of 1929. The brunt of the pay-roll reductions following 1929 appears to have fallen mainly on the clerical and inside plant employees."⁶⁵ In March 1934 the average weekly earnings of these latter were 82.9 percent and 81.7 percent, respectively, of March 1929 average weekly earnings.

⁶³ Christenson, C. Lawrence, *Employment and Earnings in Commercial Milk Distribution, 1929-34*, Monthly Labor Review, July 1936, pp. 139-49.

⁶⁴ *Ibid.*, p. 143.

⁶⁵ *Op. cit.*, p. 147.

"Although the annual 1933 aggregate pay roll for all the identical firms reporting corresponding information for 1929 and 1933 * * * was but 75.7 percent of that for 1929, nevertheless, the 1933 pay roll represented 26.9 percent of gross sales, whereas that for 1929 had only absorbed 20.9 percent of sales income in that year." ⁶⁶

In Chicago the wages of union drivers or route men reached a peak during the period May 1, 1927, to April 30, 1932, averaging about 122 percent of wages during the period May 1920 to April 1924.⁶⁷ Wages received by union drivers then declined, and averaged about 98 percent of May 1920 to April 1924 wages during the period December 1, 1932, to April 30, 1935. Retail prices of milk in Chicago were highest from May 1, 1924, to April 30, 1927, averaging about 105 percent of May 1920 to April 1924 average retail prices, and declined to about 73.5 percent of the May 1920 to April 1924 average during the period December 1, 1932, to April 30, 1935.

The foregoing figures furnish some indication of the possibility that there may be an appreciable lag in the adjustment of wages to rapidly changing economic conditions. This may be associated with a part of the rigidity of prices charged consumers for milk.

The lack of uniformity in wage rates, hours worked by employees, and the like, probably constitutes a very important factor in the competitive aspects of the milk trade. Considerable evidence is available that points to the conclusion that there are wide differences in wage rates paid by different distributors.⁶⁸ The competitive situation in this respect is somewhat analogous to that obtaining when some distributors pay uniform prices for milk and others do not. A distributor who is paying the ruling level of wages, usually negotiated by the labor union, may find himself at a serious disadvantage if other distributors are able to secure their labor at lower cost, factors other than wage rates being the same. Hence the distributor who is able to secure his labor at lower cost than that prevailing generally is in a position to continue in business and make higher profits (or smaller losses) or sell at lower prices than his competitors, other factors being the same. In Milwaukee it was found that the most efficient distributors, on a physical input-output basis, incurred higher costs partly because they paid much higher wages than their less efficient competitors.⁶⁹ Lack of uniformity in the cost rate of the inputs of a very important factor in total operating expense, labor, may operate in such fashion as to obscure efficiency of operation (physical basis), lead to the maintenance of plants that would otherwise be eliminated, and result in more inefficient distribution of milk generally. In this connection it is important to note that the larger companies, which tend to operate more efficiently on a physical basis, are those that usually employ union labor and are likely to be found to be paying higher wages than their competitors, usually the smaller firms, who do not employ union labor. The advantage of the former in physical efficiency may be entirely offset or even more than offset by paying higher wages, especially if there is a large degree of arbitrary element

⁶⁶ Christenson, C. Lawrence, *op. cit.*, p. 149.

⁶⁷ Figures on wages were calculated from data given in Federal Trade Commission, H. Doc. No. 451, 74th Cong., 2d sess., Apr. 15, 1936, p. 16.

⁶⁸ Federal Trade Commission, H. Doc. No. 451, 74th Cong., 2d sess., Apr. 15, 1936. See also Transcript of Hearing on the Proposed Code of Labor Provisions for the Fluid Milk Industry, National Industrial Recovery Administration, Nov. 20-23, 1934; vol. 2, pp. 560, 579, 597, 629, 649-651, 683, 709, 710, 774; vol. 3, pp. 1157, 1189, 1212; vol. 4, pp. 1855-1856.

⁶⁹ A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

in the wages negotiated by labor unions. The foregoing statements are not to be construed as an indictment of labor unions. All that is intended is to point out the importance of wages and their lack of uniformity between distributors in the matter of their relevancy to efficiency in milk distribution. A great deal of research is needed in order to clarify the many aspects of the labor problem as it relates to the fluid-milk trade.

4. Possible accomplishments of present regulatory measures in improving conditions in the milk trade.—As far as Federal legislation in regard to milk is concerned, the Agricultural Marketing Agreement Act carries two major provisions which provide for: (1) The classification of milk according to the use in which it is sold by handlers (distributors) and fixing, or providing a method for fixing, minimum prices which handlers shall pay for milk sold in each class; and (2) the specification of the several methods of prorating among producers the proceeds of sales to handlers (distributors).⁷⁰

The activity authorized by and undertaken pursuant to the Agricultural Marketing Agreement Act pertains primarily to the regulation of milk prices payable by distributors to producers. Fundamentally, the program is one of uniform pricing. Of course, the goal of such programs, as of all programs undertaken under the act, is that of increasing returns to producers to "parity" levels "at as rapid a rate as the Secretary of Agriculture deems to be in the public interest and feasible in view of the current consumptive demand in domestic and foreign markets. * * *"⁷¹ It might appear that the purpose of the act, as far as milk producers are concerned, could be readily achieved through the practice of arbitrarily pricing class I milk.⁷² However, there is nothing in the act that allows the Federal Government to restrict supplies on a market. As a matter of fact, it is highly improbable that producers could be restricted from entering a market, even though some people might consider such procedure proper Government policy. Also, any attempt at maintaining prices on an arbitrary level not only has a tendency, other factors being the same, to increase production within the supply area but also has a marked tendency to attract supplies from new sources, thus making it necessary to adjust prices so that the arbitrary element is removed.

This is not to say that there are no possibilities of increasing returns to producers under the program. A program that places all distributors on a uniform basis, as far as the purchase price of their milk is concerned, tends to eliminate any gains to distributors through their strong bargaining position,⁷³ to insure proper accounting for milk, and to reduce the risks of market-milk production so that there is a real gain not only to producers but to the public generally. Uniform pricing would eliminate part of the practices now rather commonly prevalent in milk markets which are not demonstrably in the public interest, at least over any appreciable period of time.

However, it should be pointed out that there is little reason to believe that uniform pricing is the answer to all the problems in the milk trade. In the first place, producer groups need to give attention to the problem of developing price structures for the various markets that are sound and constructive. In the second place, with uniform

⁷⁰ See appendix C for relevant extracts from the Agricultural Adjustment Act, as amended Aug. 24, 1935.

⁷¹ Title I, sec. 2, subpar. 2, of the Agricultural Adjustment Act, as amended Aug. 24, 1935. See also sec. 8e.

⁷² See ch. 4 and 5.

⁷³ But see ch. 2, sec. I.

buying prices the strong, heavily financed distributors may find it to their advantage to reduce margins and squeeze out competitors who might be able, were it not for the uniform prices, to weather the storm by taking reductions in prices out of returns to producers. There is little reason to become unduly exercised about such activity *per se*, since it would probably result in lower margins, but the real cause for concern in the matter pertains to the activity of distributors after they have eliminated their competitors. The remaining distributors would probably be in a position to increase resale prices and extract monopoly gains until new firms were attracted into the field, and the whole business would have to be reenacted.

Thus price regulation that stops short of regulation of resale prices really stops short of securing all the benefits that might be secured. The so-called unfair practices that have their origin in the ability to "chisel" because of nonuniformity in buying prices can be eliminated under regulation, but there still remains the possibility of monopoly profits to distributors and of having a system of distribution that is not as efficient as it might well be.

Most of the regulatory bodies operating under authority of State legislation have the power to fix prices to producers and resale prices of distributors. Such power, however, may be used to do good or harm, depending upon the manner in which it is used. If used so that producers are restricted from entering the market, and margins are granted to distributors that will allow them to operate regardless of efficiency, it is difficult to ascertain how such a program could be in the interest of the public welfare. On the other hand, if such power is used to establish sound producer price structures, and at the same time keep margins down so that inefficient distributing firms are eliminated, then such activity is in the public interest, since it would undoubtedly result in a more efficient marketing system.

Some people view with horror the matter of price fixing by the Government. It should be noted that there has been a plethora of price fixing by private business in the milk trade; hence, the removal of governmental price fixing would not eliminate price fixing in the milk industry. The change would merely be one of the agency employed and the goal desired. When prices are fixed by private business, experience seems to indicate that the elements engaged in such price fixing, while they may be interested in the public welfare, are primarily interested in increasing their own profits. While there is nothing reprehensible in the desire of people to make more money, it would nevertheless appear highly desirable that their price-fixing activities be closely regulated in order that the public interest be protected, since there are numerous activities that may be undertaken in the milk trade that, far from being in the public interest, may be antithetical to it.

5. Further centralization of the milk-distributing business.—

a. Introductory.—In addition to proposals that conditions of simple competition be made operative in milk markets, or the status prior to Federal and State regulation be reinstated, there are proposals that there should be further centralization of the milk-distributing business. The proposals range all the way from that of granting some private corporation a franchise to distribute all the milk within a city, under rigid government control, to the outright operation of municipal milk-distributing systems. Testimony along this line has been presented at several of the public hearings with respect to proposed milk-market-

ing agreements and orders in several cities. In Milwaukee, Wis., interest in municipal milk distribution became so marked that the common council of Milwaukee secured a grant of funds from the Civil Works Administration for the purpose of conducting an inquiry into the possibilities of the municipal distribution of milk. This study was completed by the Dairy Section of the Agricultural Adjustment Administration. In the town of Tarboro, N. C., a system of municipal milk distribution has been in operation for some time.

Generally speaking, it may be said that the primary reason for further centralization of milk distribution seems to be to secure lower prices to consumers, either through elimination of monopoly profits or through increases in efficiency, aside from any reductions in prices that might be secured through eliminating distributors' profits. The idea apparently is that the present system is not as efficient as it might be, or that retail milk prices have a large monopoly element and could be reduced if the monopoly element were eliminated.

In any case, it appears desirable to examine the business of milk distribution in order to ascertain whether it is inefficient and, if so, whether a greater degree of centralization could be expected to eliminate any existing inefficiency.

b. Some considerations of the efficiency of the present system of milk distribution.—Several measures of inefficiency are rather commonly accepted, such as (1) excess capacity, i. e., the failure to use machines to their full capacity, (2) low output per unit of labor, (3) duplication of services, etc.

In the first place, there does not appear to be any reason, at least a priori, to believe that, in an industry operating under conditions of complex competition, competitive forces will be strong enough so that each firm will operate at its most efficient volume, that is, at lowest average costs. (See ch. 4, sec. III, fig. 24.) On the contrary, it appears that firms operating under conditions of complex competition will generally tend to operate at some point above the least cost point, putting out a volume smaller than that associated with the lowest average cost. It should be emphasized that there is present the tendency to operate in such fashion, even under conditions of stable equilibrium, and hence excess capacity may be a normal function of an industry operating under conditions of complex competition.⁷⁴ This situation is decidedly different from that of an industry operating under conditions of simple competition. In the latter there is a tendency, at least over any appreciable period of time, for the volume produced to be that associated with the minimum cost of operation, i. e., that associated with the low point of the average cost curve. On the other hand, it may appear that this is not the true statement of the case; that excess capacity exists in most industries, many of which operate under conditions of, or closely approaching, simple competition. This may well be the case, but it cannot be considered refutation of the proposition that excess capacity may be a function of conditions of complex competition even under conditions of stable equilibrium. In the first place, the industry reputed to be operating under conditions of simple competition must be closely examined, since it is liable to be found that many such actually possess to a greater or lesser degree some of the attributes of complex competition. In the second

⁷⁴ See Chamberlin, Edward, *The Theory of Monopolistic Competition*, ch. V, pp. 104 to 109, for the general theoretical treatment of this point.

place, miscalculations and lack of foresight may lead in many cases to excess capacity in industries that are operating under conditions of, or closely approaching, simple competition. However, these cases merely point the way to the conclusion that competition is rarely pure. Competitive forces work out slowly, and it may take considerable time for productive factors to be shifted from one industry to another. Nevertheless, in spite of miscalculations, lack of foresight, etc., industries operating under conditions of simple competition tend toward a position of stable equilibrium wherein excess capacity is eliminated. Industries operating under conditions of complex competition do not necessarily tend in this direction. It is entirely logical that the latter tend to a position of stable equilibrium in which excess capacity is the rule rather than the exception.

It has been shown that the milk industry, especially in the larger markets, operates under conditions of complex competition. Hence it is to be expected that the milk industry will be found to have a significant amount of excess capacity, especially when the barriers to price competition are recognized.

Perhaps one of the major barriers to price competition is the difficulty of entering the milk business. Generally speaking, any city is composed of numerous, though perhaps closely interrelated, milk markets. Products are rather highly differentiated by trade marks, brands, and goodwill, which tend to limit the force of price competition. It is usually not only necessary to apprise consumers of the fact that any particular company charges, or will charge, lower prices than the company from whom consumers are purchasing their milk, but it is also necessary to sell them on the idea that the low-priced milk is of as high quality as the milk they purchase from their regular distributor. This is not easily done. The public is inclined to associate relatively lower prices with relatively lower quality, or poor service, or both. While it may be true that, speaking in general terms, high prices for a given type of commodity tend to be associated with high quality, the extent to which this works out in practice may well be questioned. It is highly probable that fancy prices are secured for certain brands of a particular commodity, and such high prices are imputed to high quality, when as a matter of fact the quality of the product may be more fancied than real. This may well be the case in the milk industry, where in most cities in which the sanitation authorities are doing a good job, assuming, of course, that the regulations if properly applied would result in the milk supply being pure enough for protection of the health of consumers, the milk supply takes on the character of a staple commodity that meets acceptable and well-enforced standards. In some cities where the sanitation regulations applicable to milk are not stringent, or not well enforced, or both, it may be desirable from the standpoint of the public welfare for distributors to follow a policy of product differentiation based largely on quality considerations. However, in many large cities it is probable that product differentiation of this type has gone beyond the point of any reasonable relationship to the public health and welfare and has become merely a method of securing volume of output while avoiding price competition. This is not to say that milk should not be advertised. Most dieticians agree that not enough milk is consumed as milk in the United States. As a matter of fact, any distributor who advertises milk in all probability increases his competitors' sales of milk to some extent, that is, consumers become

"milk conscious." However, considered from the viewpoint of the distributor, advertising which fails to focus attention on the milk of the advertising distributor over that of his competitors largely fails to accomplish its purpose.

Another factor that may be of some importance is what, for want of a better term, may be called the ethics of pricing. The distributor who cuts retail prices is the "chiseler", the black sheep of the family. Producers, except those who are dissatisfied with the manner in which the cooperative is handling their milk or those who for one reason or another do not wish to join the cooperative, may be somewhat loath to sell to the cut-price distributor, probably because they fear that the distributor by cutting prices may provoke a price war, in which case they stand to lose, or at least fear that they will lose. In any case, there is usually considerable pressure exerted on the price-cutting distributor in an effort to have him stop his so-called chiseling. Also, there may be some element of custom in the matter of the price of milk. The price may become "customary", and efforts to change it may meet with a large degree of resistance. In some markets the retail price of milk remained fixed at a given level for such a long period of time, especially during the years prior to the World War, that the price established might well have been considered customary. However, this latter element does not appear to have been very important in recent years, since price changes have been relatively frequent in many markets, although possessing no seasonal characteristics of any importance. Again, experience in many markets indicates that there is a great deal of inertia in milk prices to consumers. Proposals to change the price usually meet with rather a marked degree of resistance, perhaps because of the fear of consumers' response to an increase, the fear that the increase may not be uniform among distributors, and, in cases of decreases, the unfavorable reaction on the part of producers, whose prices are usually lowered when the retail price changes to any appreciable degree. In short, the uncertainty as to the course of events in the market when the price is changed is a rather strong barrier to frequent changes in the price to consumers.⁷⁵

Another factor of importance in this connection is that, although distributors, usually small ones, may gain business by cutting prices, the degree to which they can cut into the other distributors' business may be greatly attenuated. In the first place, as the distributor grows in size, he may be confronted by operating problems of considerable magnitude. If he has started in a small way, any considerable expansion may necessitate a rather extensive expansion of his plant. If he is gaining business by cutting prices it is highly probable that a marked increase in his business at the expense of other firms will lead to reprisals on their part. While they may let him take a part of their business away from them it is difficult to ascertain at just what point his competitors will decide that he has gone far enough and will reduce their prices to meet his competition and perhaps go farther, figuring that it costs them less to force him out of business than it does to allow him to continue taking their trade away from them. This may be quite an important factor as far as price competition in the milk trade is concerned. The large firms generally set the level at which most of the milk in the market will be sold, and usually have strong financial

⁷⁵ Compare this with the treatment of the general effect of uncertainty on the action of competitors under conditions of complex competition, quoted in ch. 4.

resources, strong in relation to the usual cut-price dealer, in any case. Further, the last two decades have witnessed the growth of Nation-wide, strongly financed dairy companies. Such firms can lose money in one market while making up the losses in another, and the matter of trying to undersell such firms in any particular market, strongly financed as they are, is indeed cause for reflection on the part of the smaller, less adequately financed distributor.

All of the foregoing discussion indicates that there may be an appreciable lack of price competition in milk markets, and that there is likely to be a rather large amount of excess productive capacity in the milk trade. For these reasons prices may be expected to be higher than they would be if competitive forces were strong enough to force distributors to operate at the point of minimum average costs. This is not to say that prices are higher than they would be under conditions of simple competition. What is meant is that, if distributors could operate at their most efficient point, prices would tend to be lower than they are under the present conditions of complex competition.

Another factor of importance is that, although competitive forces in the milk trade may operate over a period of time to eliminate unnecessary plants and equipment, it is highly probably that the relative rigidity of milk prices may from time to time lead to redundant capacity. Thus, with changing economic conditions, distributors may not change their prices rapidly enough, especially when economic conditions in the market indicate that a decrease in prices should take place, thereby increasing their margins, their profits, and attracting new capital into the field. Retail prices usually lag behind the prices received by farmers for milk, especially when the trend of prices is downward. Generally speaking, 1930 and 1931 were profitable years in the milk trade. Retail and wholesale prices declined at a slower rate than prices paid farmers for milk. (See table 43, figs. 46 and 47.) Also, it is probable that other cost elements, such as

TABLE 43.—*Index numbers of dealers' buying prices, dealers' retail and wholesale selling prices, and retail prices at stores, 1919-35 (1925-29=100)*

Year	Index numbers of				
	Dealers' buying prices 3.5 percent milk f. o. b. city	Dealers' wholesale selling prices per gallon, bulk lots of 5-20 gallons	Dealers' wholesale selling prices per quart bottled. cases of 12	Dealers' retail prices per quart bottled and delivered to family trade	Average retail price per quart bottled at stores
	Percent	Percent	Percent	Percent	Percent
1919.....	124.5	118.3	114.5	110.3	109.8
1920.....	125.2	124.8	122.2	117.4	119.2
1921.....	98.6	104.5	103.2	102.7	102.9
1922.....	89.2	92.8	89.8	91.4	92.6
1923.....	99.2	99.6	98.9	98.6	99.1
1924.....	95.8	97.4	97.5	97.6	97.7
1925.....	97.8	98.3	98.0	98.3	97.8
1926.....	99.1	99.2	98.8	98.8	99.6
1927.....	99.9	99.6	100.0	100.0	99.9
1928.....	100.6	100.5	100.7	100.7	100.4
1929.....	102.6	102.3	102.5	102.3	102.2
1930.....	99.1	100.4	101.0	100.3	101.1
1931.....	81.4	90.2	88.1	88.6	88.2
1932.....	63.2	77.3	74.3	76.5	75.0
1933.....	60.3	74.3	71.6	74.0	72.8
1934.....	71.0	83.2	79.4	81.0	79.1
1935.....	75.3	86.4	82.8	84.4	82.5

Compiled from unpublished data in the files of the Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

supplies and perhaps labor, were also decreasing. All of these factors tended to increase the profitability of the milk trade. Records taken in the Milwaukee study previously referred to indicate that during the period 1928 to April 30, 1934, net profits expressed as a percentage of total capital employed ranged from an average loss of 1.7 percent in 1933 to an average profit of 8.8 percent in 1930 and 4.3 percent in 1931. Losses were also high in 1928, averaging 1.3 percent of total capital employed. Profits expressed as a percentage of net worth ranged from an average loss of 3.6 percent in 1928 to an average profit of 25.6 percent in 1930 and 11.2 percent in 1931.

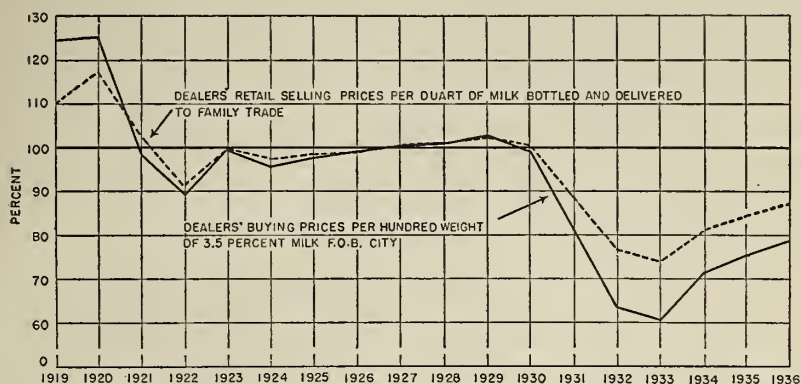


FIGURE 46.—Indices of dealers' buying prices per hundredweight of 3.5 percent milk f. o. b. city, and dealers' retail selling prices per quart bottled and delivered to the family trade, by years 1919-36 (1925-29=100).

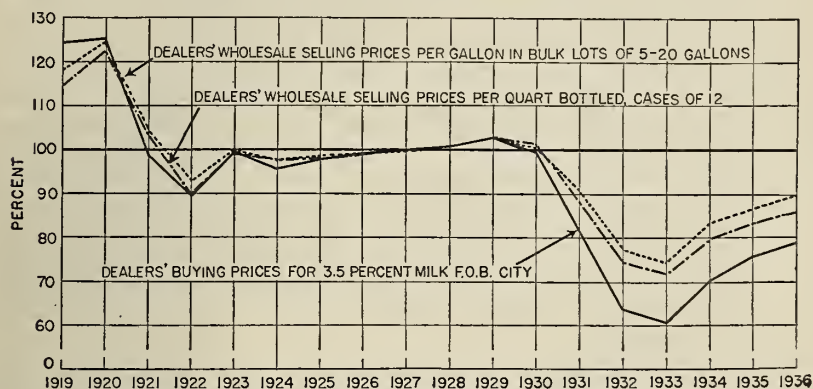


FIGURE 47.—Indices of dealers' buying prices for 3.5 percent milk f. o. b. city, and dealers' wholesale selling prices per gallon in bulk lots of 5-20 gallons and per quart bottled, cases of 12, 1919-36.

There is considerable evidence to the effect that the relative profitableness of the milk-distributing business during the early years of the depression attracted not only a significant number of new distributors into the field but also contributed to a rather marked increase in the number of producer-distributors.

In Milwaukee the number of distributors declined from about 200 in 1914 to 32 in 1920 and to 13 in 1930. This decline in the number

of distributors was probably due in part to the enforcement of a health ordinance to the effect that all pasteurized milk must be pasteurized within the city limits, and in part to the rapid consolidation of business units during this period. However, the number of distributing firms in Milwaukee increased from 1930 to 1934. There were 10 companies in business during 1934 which had been established prior to 1925, and several of these were established around 1900. During 1930, 10 firms, established prior to 1925, handled all except about one-half of 1 percent of the total receipts of milk in the market. In 1934 these firms handled only about four-fifths of the total receipts. The remainder of the volume was handled by two types of companies—those which entered the market after the beginning of 1930 and remained in business through 1934, and those which came in and disappeared during this period. A classification of distributors according to net changes in fluid-milk sales shows that the old companies handled practically the entire market volume in 1930 and in 1934 handled only slightly more than three-fourths of the fluid sales in the market—considerably less than the proportion of receipts handled in the same year. For the new and other companies, the percentage of total receipts represented by surplus was lower in each year than for the old companies.

Tinley points out that there was an increase in the number of milk distributing firms in the East Bay milk market during the period 1929 to 1931, and attributes the increase in the number of firms partly to the apparent relative profitableness of the milk-distributing business during this period.⁷⁶

The Federal Trade Commission, in its recent investigations of the milk industry under authority of House Concurrent Resolution No. 32, Seventy-third Congress, second session, has ascertained the rates of return earned by distributors in several markets. Table 44 shows the rate of return earned by identical company groups in Connecticut markets during the period 1930 to 1933. The highest rate of return on total capital invested, 18.7 percent, was shown in 1931. The low point of 5.2 percent was reached in 1933. Rates of return expressed as a percentage of stockholders' investment and total investment in the milk business show similar results. Rates of return for identical company groups in the Philadelphia, Baltimore, Cincinnati, St. Louis, and Boston markets show like results. (See tables 45 and 46.)

Although data are rather scarce, it appears that in some markets there has been an increase not only in the number of producer-distributors but also an increase, rather marked in some cases, in the number of peddlers.⁷⁷

On the whole, it appears reasonable to conclude that there was a tendency for the number of distributors to increase in many milk markets during the early years of the depression, and that at least a part of this increase can reasonably be attributed to the relative profitableness of the milk distributing business during this period. However, it does not follow that the capacity of plants and equipment increased as rapidly as did the number of milk distributors.

⁷⁶ Tinley, J. M., and Blank, Martin H., *An Analysis of the East Bay Milk Market*, University of California, Agricultural Experiment Station, Bulletin No. 534, June 1932, pp. 83 to 85.

⁷⁷ Based on testimony presented at several milk hearings held in connection with the issuance of Federal milk-marketing agreements and orders (licenses).

TABLE 44.—Rate of return on stockholders', total, and milk-business investment of identical company groups of Connecticut milk distributors, 1930-33

Year	Company groups	Rate of return on—		
		Stockholders' investment ¹	Total investment ¹	Milk-business investment ¹
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1930	Larger companies.....	19.68	18.97	19.63
	Smaller companies.....	14.08	11.91	13.85
	Total.....	18.96	17.87	18.83
1931	Larger companies.....	20.59	19.99	20.71
	Smaller companies.....	13.53	11.82	14.40
	Total.....	19.61	18.67	19.79
1932	Larger companies.....	12.47	12.26	12.99
	Smaller companies.....	8.80	8.11	9.29
	Total.....	11.96	11.60	12.43
1933	Larger companies.....	6.12	6.11	6.95
	Smaller companies.....	2.63	.24	.87
	Total.....	5.21	5.23	6.06
1930-33 ³	Larger companies.....	14.34	14.03	14.94
	Smaller companies.....	8.58	7.88	9.43
	Total.....	13.58	13.06	14.14

¹ Mean of the investment at the beginning and end of the year.² Percent of loss on investment.³ Average.

Compiled from Federal Trade Commission, H. Doc. No. 387, 74th Cong., 2d sess., Jan. 8, 1936, table 8, p. 46.

TABLE 45.—Rate of return on stockholders', total, and milk-business investment of identical company groups of Philadelphia milk distributors, 1930-34

Year	Company groups	Rate of return on—		
		Stockholders' investment ¹	Total investment ¹	Milk-business investment ¹
		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1930	Larger companies.....	20.31	19.85	21.12
	Smaller companies.....	18.82	14.03	14.48
	Total.....	20.29	19.74	20.99
1931	Larger companies.....	20.09	19.59	20.97
	Smaller companies.....	18.37	13.96	14.34
	Total.....	20.06	19.48	20.84
1932	Larger companies.....	14.19	13.90	15.39
	Smaller companies.....	15.25	12.32	12.70
	Total.....	14.21	13.86	15.32
1933	Larger companies.....	8.09	8.09	9.17
	Smaller companies.....	8.81	7.70	7.85
	Total.....	8.11	8.08	9.13
1934	Larger companies.....	² 5.07	5.19	5.75
	Smaller companies.....	³ 10.33	9.24	9.43
	Total.....	5.19	5.30	5.85
1930-34 ⁴	Larger companies.....	13.74	13.53	14.95
	Smaller companies.....	13.66	11.24	11.53
	Total.....	13.74	13.48	14.87

¹ Mean of the investment at the beginning and end of the year.² Actual earnings and mean investment for 9-month period for 1 company, and for a 10-month period for 2 companies, adjusted to 12-month basis.³ Actual earnings and mean investment for 6-month period adjusted to 12-month basis for 1 company. Actual earnings and mean investment for 10-month period for 2 companies and for 11-month period for 1 company, adjusted to 12-month basis.⁴ Average.

Compiled from Federal Trade Commission, H. Doc. No. 387, 74th Cong., 2d sess., Jan. 8, 1936, table 12, p. 55.

TABLE 46.—*Net income from the milk business of certain distributors in Baltimore, St. Louis, Cincinnati, and Boston, expressed as a percentage of actual investment in the milk business, 1930-35*¹

Market	Number of companies	Rate of return on investment			
		1930	1933	1934	1935
		Percent	Percent	Percent	Percent
Baltimore.....	2	25.6	18.1	14.0	14.9
Cincinnati.....	4	13.1	2.02	8.5	10.0
St. Louis.....	3	19.4	3.7	.5	2.8
Boston.....	2	20.5	13.3	3.3	11.4

¹ Return shown based on "actual" investment in the milk enterprise, which does not include appreciation recorded on the books of some of the companies.

² Represents loss.

Compiled from summary of Federal Trade Commission, Milk Market Regulation and Practices of Distributors in Relation to Margins, Costs, and Profits of Distributors in Boston, Baltimore, Cincinnati, and St. Louis, June 4, 1935.

Unfortunately, figures on the capacity of the plants and equipment used in the milk-distributing business are almost completely lacking. The only recent figures available in this connection were developed in connection with the Milwaukee survey mentioned previously. While the figures pertain only to Milwaukee, they may be taken as a general indication of the conditions that would probably be found to exist in many milk markets. These figures show that pasteurization equipment was utilized 55.7 percent of capacity, bottle-filling equipment 44.7 percent of capacity, and bottle-washing equipment 51.7 percent of capacity. Delivery-equipment capacity utilized amounted to 54 percent of capacity on retail and mixed routes, 62.9 percent on wholesale routes, and 55.7 percent on the average (retail and mixed and wholesale routes combined).⁷⁸

Perhaps the most noticeable element of alleged inefficiency in the milk distribution business is duplication of delivery services. Many people find it extremely hard to understand why there are often several milk wagons of different companies delivering milk to consumers in the same block, and in many cases several wagons delivering milk to the same apartment house or multiple-unit dwelling, sometimes to the same customers. The idea is often expressed that, if the market structure were better organized, these duplications would be eliminated and the cost of milk to consumers reduced. Data with respect to duplication of delivery services, overlapping routes, etc., are not available in sufficient quantity to arrive at any measure of duplication in large milk markets, excepting for Milwaukee where such data were developed in connection with the "Survey of Milk Marketing in Milwaukee", mentioned previously. While these data are fairly complete with respect to Milwaukee, they serve only as a general indication of the conditions that might be found in other markets, and must not be construed to represent the degree of duplication of delivery services that might be found in other markets. However, there is no reason to believe that the milk industry in Milwaukee is relatively more or less efficient than in other cities of similar size.

At the time of the Milwaukee study there were 815 miles of streets in Milwaukee proper and 282 miles in the suburbs, a total of 1,097 miles. The total mileage traveled on the retail and mixed routes of

⁷⁸ A Survey of Milk Marketing in Milwaukee, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

the Milwaukee firms included in the analysis was 11,830 miles. Their wholesale routes covered 2,046 miles.

In six selected areas in Milwaukee duplications in delivery service, i. e., delivery in a block by more than one company, were found for all but one of the blocks studied. Deliveries were made by 5 or more companies in 800 of the 1,020 blocks. There were 7 duplications of delivery (see above) in 147 blocks, and 6 in 146 different blocks. Fifteen companies were delivering milk in each of 2 blocks, and in 1 block 17 companies were competing, these blocks representing the most extreme cases of duplication of services. In total, there were 5,948 duplications in service, an average of 5.8 duplications for every block included. These averages ranged from 7.8 duplications in one area to a low of 3.1 duplications in another.

Data from the consumers' survey collected in the Milwaukee study show that the number of duplications of service in each block averaged 6.6. No ward (1930 basis) was served by fewer than nine companies. Deliveries were made by at least 15 companies in 14 of the 25 wards, with 20 companies making deliveries in wards 12 and 25.

Duplications in delivery service, even to individual premises, were quite large; 17.7 percent of the total number of premises surveyed were visited by route men of two or more distributors. The results indicate that the total number of duplications was 24.1 percent of the total number of premises visited.

All of this suggests the rather strong probability that there is a rather marked degree of excess capacity in the milk trade, a high degree of duplication of services, and a rather inefficient system. As was noted before, it is sometimes suggested that further centralization of the milk business, either through a rigidly controlled private monopoly or outright public control, would result in at least partial elimination of some of the redundant capacity and duplication of services. The recent "Survey of Milk Marketing in Milwaukee" attempted an appraisal of the possibilities of a centralized milk-distributing system. The results of this portion of the study are presented in the following section as a general indication of the operation of a centralized system as compared to the present system.

c. The possibilities of a centralized system of milk distribution in Milwaukee.—The apparent reason for the study of the Milwaukee milk market was to evaluate the possibilities of developing a unified processing and distributing system for milk.⁷⁹

The major enterprise of the unified system would be that of pasteurizing and delivering all fluid milk and cream sold in Milwaukee, with specifications for facilities for the conversion of excess milk into manufactured products. Regular milk, grade A and vitamin D milk, cream, chocolate milk, buttermilk, butter, ice cream, cottage cheese, and powdered skim milk would be handled by the system.

Estimated total operating costs of the unified system per unit of milk receipts are about one-half the average costs obtaining in the market during the first 4 months of 1934. Thus, it appears that a marked reduction in costs could be brought about by the operation of a central plant and unified distributing system. (See table 47.)

⁷⁹ A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

TABLE 47.—*Estimated unit costs of operation for the proposed unified system compared with costs obtaining under the competitive system in Milwaukee, Wis., first 4 months of 1934*

Unit costs of operation	Unified system	Competitive companies ¹		
		Average	High	Low
Per quart of milk receipts:				
Processing, selling, and administrative:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Labor.....	0.28	0.69	1.94	0.37
Other than labor.....	.55	.75	2.08	.64
Total.....	.83	1.44	4.02	1.01
Delivery:				
Labor.....	.68	1.38	1.45	.61
Other than labor.....	.14	.48	1.04	.27
Total.....	.82	1.86	2.49	.88
Total operating costs:				
Labor.....	.96	2.07	3.39	.98
Other than labor.....	.69	1.23	3.12	.91
Total.....	1.65	3.30	6.51	1.89
Per quart of milk and cream sales:				
Processing, selling, and administrative:				
Labor.....	.68	1.05	3.05	.61
Other than labor.....	1.32	1.19	3.29	1.08
Total.....	2.00	2.24	6.34	1.69
Delivery:				
Labor.....	1.62	2.15	2.29	1.02
Other than labor.....	.35	.76	1.64	.45
Total.....	1.97	2.91	3.93	1.47
Total operating costs:				
Labor.....	2.30	3.20	5.34	1.63
Other than labor.....	1.67	1.95	4.93	1.53
Total.....	3.97	5.15	10.27	3.16

¹ Based upon costs of 20 companies obtaining during the first 4 months of 1934.

Compiled from A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

The company having the lowest unit operating costs in the market sold about 60 percent of its total sales in the form of milk, distributed largely on wholesale routes. Since per unit delivery costs are generally lower for wholesale routes than for retail routes, the delivery costs incurred by this company are lower probably than would have been the case had the volume of products distributed on the routes been wholesale and retail in the proportions found for the market as a whole.

The reproductive and sound values of the fixed assets of 23 Milwaukee firms, together with the estimated investment for the proposed unified system both in absolute amounts and in terms of receipts, sales, and employees, are set forth in table 48. On the basis of these data, the total investment in the unified system, as measured by total value and in units of receipts and sales, would be somewhat lower than that for the firms now operating in the market. However, the investment as measured in terms of employees is higher under the unified system than for the competitive companies. This is probably due to the fact that the number of employees under the unified system would be about 30 percent less than the number employed by the competitive plants, and the investment per employee high because of the

use of machinery and equipment which would be as automatic as possible.

TABLE 48.—*Estimated capital investment for the proposed central plant and unified distribution system compared with the reproductive and sound values of plants of 23 companies in Milwaukee, Wis., as of Apr. 30, 1934*

Investment	Unified system	23 companies ¹	
		Reproductive value	Sound value
Buildings:	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Total.....	1, 265, 702.58	2, 306, 157.82	1, 936, 199.84
Per quart of milk receipts.....	.0051	.0152	.0076
Per quart of milk and cream sales.....	.0120	.0237	.0200
Per plant employee.....	2, 263.79	4, 575.71	3, 841.66
Mechanical equipment:			
Total.....	993, 170.96	1, 501, 097.98	974, 591.36
Per quart of milk receipts.....	.0039	.0099	.0038
Per quart of milk and cream sales.....	.0094	.0155	.0100
Per plant employee.....	2, 080.88	2, 978.21	1, 933.71
Delivery equipment:			
Total.....	² 716, 256.12	980, 625.74	548, 709.36
Per quart of milk receipts.....	.0028	.0065	.0022
Per quart of milk and cream sales.....	.0068	.0101	.0057
Per delivery employee.....	1, 065.79	749.71	419.50
Total investment:³			
Total.....	2, 975, 129.66	4, 787, 881.54	3, 459, 500.56
Per quart of milk receipts.....	.0118	.0316	.0136
Per quart of milk and cream sales.....	.0282	.0493	.0357
Per employee ⁴	2, 29.863	2, 283.25	1, 649.73

¹ Values of fixed assets as of Apr. 30, 1934, compared with total volumes reported for the year 1934.

² Includes 30 ice-cream trucks valued at \$62,583.60 and interplant trucking equipment valued at \$92,112.08.

³ Total investment exclusive of land and office furniture and equipment.

⁴ Based on total personnel employed.

Compiled from A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

Total delivery distance under the unified delivery system probably could be reduced from 13,876 miles (total of wholesale and retail routes as of Mar. 16, 1934) to about 3,900 miles, a decrease of almost 72 percent of the total mileage of the competitive companies.

Plant characteristics of the proposed central plant (including the country stations) are compared in table 49 with those of 22 companies.

TABLE 49.—*Characteristics of the proposed central plant compared with those of the competitive plants, Milwaukee, Wis.*

Characteristic	Unified system	22 companies		
		Average	High	Low
Average daily receipts per employee (quarts).....	1, 449	845	¹ 1, 410	174
Average daily sales of milk and cream per employee (quarts).....	604	541	¹ 1, 056	155
Hours required daily:				
Pasteurization ²	5.0	3.0	6.3	0.6
Bottle filling ³	4.2	2.4	5.7	0.4
Bottle washing ³	4.2	2.7	5.7	0.3
Estimated utilization of capacity (percent):⁴				
Pasteurization ²	90.9	55.7	117.9	10.8
Bottle filling ³	76.1	44.7	107.2	7.0
Bottle washing ³	76.1	51.7	107.2	4.9
Floor space (square feet):				
Per employee ⁵	390	588	1, 587	302
Per quart of average daily receipts.....	0.3	0.7	2.5	0.3
Per quart of average daily sales of milk and cream.....	0.6	1.1	3.1	0.4

¹ This ratio is of a company operating a wholesale business exclusively.

² Pasteurization of milk only.

³ Based on volumes of milk and cream (assumed to be in quart units only).

⁴ Based on an operating time of 5½ hours.

⁵ Data on floor space are available for but 10 companies.

Compiled from A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

As far as gains possible under the unified system are concerned, the designers estimated that, on the basis of 1934 price levels, resale prices could be reduced by the following amounts:

- (a) Milk sold wholesale and retail, 2 cents per quart;
- (b) Cream sold retail, 8 cents per quart, and cream sold wholesale, 5 cents per quart; and
- (c) Ice cream sold retail, 15 cents per gallon, and ice cream sold wholesale, 10 cents per gallon. (See table 50.)

On the basis of the prices noted above, it was estimated that daily revenue from sales would amount to about \$37,298, as compared with \$42,817 under prices then prevailing in the market. (See table 50 for prices of butter, cottage cheese, and dry skim milk, which would be sold at market prices.) Thus, it appears that there would be a reduction in cost to consumers of about \$5,519 daily.

TABLE 50.—*Estimated revenue of the unified system on the basis of actual and estimated 1934 prices Milwaukee, Wis.*

Commodity	Volume	Actual 1934 prices		Estimated prices as of 1934		Revenue from ¹ actual 1934 prices		Estimated revenue as of 1934 ¹	
		Retail	Wholesale	Retail	Wholesale	Retail	Wholesale	Retail	Wholesale
		<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>
Fluid milk, all grades.....quarts.....	232,558	0.10	0.09	0.08	0.07	19,767.40	3,139.56	15,813.92	2,441.88
Cream, all grades.....do.....	6,500	.48	.40	.40	.35	2,652.00	390.00	2,210.00	341.25
Cottage cheese.....pounds.....	5,000	.05	.04	.05	.04	212.50	30.00	212.50	30.00
Butter.....do.....	26,500	.35	.32	.35	.32	7,883.75	1,272.00	7,883.75	1,272.00
Ice cream.....gallons.....	3,770	1.40	1.00	1.25	.90	3,770.00	3,770.00	3,393.00	3,393.00
Dry skim milk.....pounds.....	74,000				.05		3,700.00		3,700.00
Total.....						30,515.65	12,301.56	26,120.17	11,178.13
Total wholesale and retail.....						42,817.21		37,298.30	

¹ All products except ice cream and dry skim milk have been assumed to be sold on the following basis: Wholesale, 15 percent; retail, 85 percent.

Compiled from A Survey of Milk Marketing in Milwaukee, Dairy Section, Division of Marketing and Marketing Agreements, Agricultural Adjustment Administration.

From the estimated daily sales values noted above, operating expenses, estimated at about \$11,410 daily, would be deducted, leaving about \$25,900 from which to pay producers and provide for nonoperating charges. On this basis (assuming 0.125 cent per quart for nonoperating charges) returns to producers would be increased about 14 cents per hundredweight under the reduced price schedule, or about 25 cents per hundredweight if prices were unchanged.

It should be recognized that more work needs to be done before other than tentative conclusions should be drawn with respect to reorganization of the milk-distributing business. In the first place, it should be evident that the monopolization of the milk business, whether publicly owned, or privately owned subject to public control, is a drastic step. It would be well to proceed cautiously. In the second place, it is highly probable that many economies in milk distribution could be effected without necessarily abandoning the present system. In the third place, monopolization of the milk business, such as analyzed in the Milwaukee study, would undoubtedly raise a host of new problems, many of which could be answered only through

experience in operating such a system. It should be emphasized that whether the estimated gains would actually be realized if the unified system were put into effect depends in large measure upon the efficiency of management and the freedom given such management in formulating operating policies. As far as the proper physical handling of the plant and distributive system is concerned, the problem should not be very great, at least not insurmountable, since the elimination of competition would also eliminate some of the most vexing problems that confront the private operator. The major problem would be one of public relations. Producers would probably think the "trust" was unfair to them in the matter of prices. Consumer representatives would probably decry any advance in the price, and unless the problem were very carefully handled the two groups would tend to become opposed to each other. Of course, it may be assumed that reasonable, well-qualified representatives of both groups would be selected who would be able to work together amicably. However, this is a very large assumption. Experience has tended to demonstrate that representatives of neither group are always free from bias. The producer group usually wants higher prices, and the consumer group wants lower prices or else wants a big increase in producer prices to come out of distributors' margins. The representatives of the producer group are generally more conversant with market conditions than the representatives of the consumer group. Further, the producer group usually has available some person more or less familiar with the economics of the milk trade, whereas it is exceedingly difficult to get sound business men to devote enough time to the problem to really learn the economics of the milk trade and give adequate representation to consumer interests.

About the most that can be drawn from the results of the "Survey of Milk Marketing in Milwaukee" is that there appear to be possibilities of realizing marked economies in the milk-distribution business through further centralization. It would be desirable for the experiment to be undertaken in some fairly large market, such as Milwaukee, given a fair trial, and the results carefully appraised. However, it should be realized that the undertaking is difficult and expensive, and it would be wise to proceed with caution.

APPENDIXES

APPENDIX A—TABULAR DATA

TABLE 51.—*Production of butter, cheese, and evaporated milk of each State expressed as percent of total production in the United States, 1935*

State	Butter		Cheese		Evaporated milk	
	Volume	Percent of total	Volume	Percent of total	Volume	Percent of total
	1,000 pounds		1,000 pounds		1,000 pounds	
Maine.....	21	(1)	1	(1)		
New Hampshire.....						
Vermont.....	2,817	0.2	1,005	0.2		
Massachusetts.....	1,050	.1	323	.1		
Rhode Island.....	19	(1)	15	(1)		
Connecticut.....	199	(1)	50	(1)		
New York.....	14,034	.9	50,055	8.1	116,409	6.3
New Jersey.....	33	(1)	41	(1)		
Pennsylvania.....	12,283	.7	4,119	.6	29,340	1.6
North Atlantic.....	30,456	1.9	55,610	9.0	145,749	7.9
Ohio.....	82,640	5.1	14,610	2.4	143,095	7.8
Indiana.....	3,935	4.5	22,126	3.6	38,688	2.1
Illinois.....	71,360	4.4	24,338	3.9	117,836	6.4
Michigan.....	77,439	4.7	11,892	1.9	83,511	4.5
Wisconsin.....	159,908	9.8	354,929	57.1	713,447	38.8
East North Central.....	465,282	28.5	427,895	68.9	1,096,577	59.6
Minnesota.....	272,585	16.7	11,254	1.8	11,995	.7
Iowa.....	217,810	13.3	2,992	.5	18,019	1.0
Missouri.....	87,438	5.4	8,765	1.4	35,177	1.9
North Dakota.....	39,726	2.4				
South Dakota.....	36,122	2.2	1,088	.2		
Nebraska.....	76,400	4.7	1,441	.2		
Kansas.....	69,548	4.3	7,539	1.2	23,250	1.3
West North Central.....	799,629	49.0	33,079	5.3	88,441	4.9
Delaware.....	30	(1)	57	(1)		
Maryland.....	1,239	.1	1		19,422	1.1
Virginia.....	6,353	.4	74	(1)	6,099	.3
West Virginia.....	356	(1)				
North Carolina.....	2,433	.2	457	.1		
South Carolina.....	724	(1)	105	(1)		
Georgia.....	1,805	.1	127	(1)		
Florida.....	239	(1)			181	(1)
South Atlantic.....	13,179	.8	821	.1	25,702	1.4
Kentucky.....	21,950	1.3	5,314	.9	51,646	2.8
Tennessee.....	15,920	1.0	7,759	1.2	43,430	2.4
Alabama.....	1,486	.1	1,723	.3	5,821	.3
Mississippi.....	6,030	.4	7,228	1.2	19,357	1.1
Arkansas.....	5,503	.3	1,687	.3		
Louisiana.....	1,519	.1	641	.1		
Oklahoma.....	38,674	2.4	6,549	1.1		
Texas.....	25,766	1.6	10,548	1.6	6,236	.3
South Central.....	117,448	7.2	41,449	6.7	126,49C	6.9
Montana.....	12,577	.8	1,862	.3		
Idaho.....	28,452	1.7	8,841	1.4	14,717	.8
Wyoming.....	2,144	.1	2,211	.4		
Colorado.....	18,261	1.1	3,060	.5	16,857	.9
New Mexico.....	1,132	.1				
Arizona.....	1,941	.1	491	.1	4,104	.2
Utah.....	8,788	.5	4,277	.7	47,581	2.6
Nevada.....	1,477	.1	27	(1)		
Washington.....	37,299	2.3	9,616	1.5	60,106	3.3
Oregon.....	29,918	1.8	16,620	2.7	24,667	1.3
California.....	64,377	3.9	15,097	2.4	187,899	10.2
Western.....	206,386	12.6	62,102	10.0	355,931	19.3
United States.....	1,632,380	100.0	620,956	100.0	1,838,890	100.0

¹ Less than 1/10 of 1 percent.

Computed from data given in reports of the Bureau of Agricultural Economics, U. S. Department of Agriculture.

TABLE 52.—*Evaporated milk: Production of unskimmed, unsweetened evaporated milk, case goods, in the United States, by sections, 1920-35*

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1920	511	138,191	591,970	20,887	2,000	-----	-----	47,784	178,530	979,873
1921	4,513	165,244	584,706	22,274	11,221	-----	-----	48,163	192,051	1,025,172
1922	1,114	211,216	468,172	17,925	10,683	-----	-----	52,953	187,846	949,909
1923	2,114	255,265	693,733	24,437	11,239	-----	723	62,841	202,168	1,252,520
1924	2,422	168,149	692,701	38,047	10,930	-----	-----	70,243	207,263	1,189,755
1925	4,789	154,490	694,514	49,463	10,062	-----	-----	69,101	220,037	1,202,456
1926	4,049	127,530	685,537	59,066	8,219	-----	-----	74,410	199,665	1,158,476
1927	4,224	138,603	702,527	67,030	14,823	20,115	494	85,742	240,257	1,373,815
1928	3,712	116,158	707,156	65,564	9,389	52,598	-----	94,723	217,692	1,237,022
1929	3,185	102,476	882,096	79,979	15,348	88,537	625	94,351	233,047	1,499,644
1930	400	107,031	813,747	85,837	13,201	84,629	5,672	97,906	240,726	1,449,149
1931	-----	109,702	798,017	75,622	13,809	84,234	10,787	95,476	241,346	1,428,993
1932	-----	129,651	888,345	80,846	14,684	99,138	11,299	79,059	267,590	1,570,612
1933	-----	116,834	1,005,248	86,380	16,200	102,732	8,171	93,626	287,509	1,716,700
1934	-----	105,845	1,033,690	83,130	13,330	107,962	6,240	86,795	269,578	1,711,570
1935	-----	145,749	1,096,577	88,441	25,702	120,254	6,236	83,259	272,672	1,838,890

Compiled from reports of the Bureau of Agricultural Economics.

TABLE 53.—*Cheese: Production of all cheese except cottage, pot, and baker's, in the United States, by sections, 1920-35*

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1920	2,627	60,154	268,962	6,888	470	26	3	4,838	18,463	362,431
1921	2,570	62,785	258,360	6,753	332	85	19	6,248	18,686	355,838
1922	1,754	72,593	261,062	6,242	361	72	57	11,391	16,448	369,980
1923	2,037	59,220	297,524	8,344	298	335	-----	11,449	15,396	394,603
1924	2,538	61,628	305,927	11,081	279	398	39	15,017	17,033	413,940
1925	1,903	62,728	336,355	10,347	155	358	9	14,417	17,242	443,514
1926	1,932	55,991	322,645	11,150	111	172	174	16,118	19,123	427,416
1927	1,193	53,393	303,613	10,371	165	169	6	16,804	20,972	406,686
1928	1,301	64,030	301,052	17,857	755	4,255	1,526	19,887	26,856	437,519
1929	1,367	56,452	339,932	23,605	1,450	9,661	4,587	19,620	27,259	483,933
1930	1,869	61,503	349,484	21,679	1,595	9,236	4,978	20,457	29,566	500,367
1931	726	55,786	347,476	20,603	1,252	9,669	6,568	17,339	32,960	492,379
1932	681	49,740	335,871	19,552	850	11,724	11,929	18,624	35,132	454,103
1933	1,142	55,407	368,267	25,156	1,061	14,356	17,405	21,088	39,853	543,735
1934	937	58,274	397,896	28,379	759	15,518	16,637	21,153	39,569	579,122
1935	1,395	54,215	427,895	33,079	821	22,024	19,425	20,769	41,333	620,956

Compiled from reports of the Bureau of Agricultural Economics.

TABLE 54.—*Dry skim milk: Production of dry skim milk in bags and barrels, in the United States, by sections, 1920-35*

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
1920	-----	21,453	10,078	1,285	454	-----	64	376	8,183	41,893
1921	-----	17,292	9,052	775	282	-----	-----	263	10,882	38,546
1922	-----	20,535	6,451	354	39	30	-----	276	12,932	40,617
1923	-----	26,624	13,854	1,218	237	2	-----	435	19,881	62,251
1924	-----	26,884	15,539	1,304	607	-----	-----	221	24,664	69,219
1925	-----	28,533	15,405	2,026	758	-----	-----	346	26,249	73,317
1926	-----	28,261	21,774	3,144	922	-----	-----	322	37,295	91,718
1927	87	32,850	24,482	4,994	2,070	1,128	-----	499	52,013	118,123
1928	22	40,039	37,702	9,547	2,309	2,771	880	1,059	53,667	147,996
1929	672	49,557	69,270	15,068	2,936	4,211	2,015	3,294	61,036	207,579
1930	1,349	59,861	95,867	21,122	4,114	5,398	5,958	5,374	61,632	260,675
1931	484	69,538	90,215	18,416	3,384	4,909	2,636	5,459	66,897	261,993
1932	542	81,708	83,893	22,917	6,324	4,558	2,907	6,633	60,712	270,194
1933	898	81,475	88,156	27,417	6,071	5,724	2,324	8,952	67,097	288,114
1934	1,229	78,724	101,964	28,305	3,265	5,957	1,665	13,276	60,550	294,935
1935	4,992	79,942	104,398	24,275	3,477	7,236	1,472	11,741	59,973	297,506

Compiled from reports of the Bureau of Agricultural Economics.

TABLE 55.—Gross income from farm production of 78 crops and 13 livestock items, gross income from milk production, each State's milk income expressed as percent of United States total and each State's milk production expressed as percent of total farm production, 1935

State and geographic division	Gross income from farm production ¹	Gross income from milk produced on farms		Income from milk as percent of income from farm production
	1,000 dollars	1,000 dollars	Percent of total	Percent
Maine.....	59, 110	15, 512	0.9	26.2
New Hampshire.....	22, 186	9, 312	.6	42.0
Vermont.....	42, 548	26, 210	1.6	61.6
Massachusetts.....	67, 172	24, 938	1.5	37.1
Rhode Island.....	9, 091	4, 298	.3	47.3
Connecticut.....	47, 460	19, 310	1.1	40.7
New York.....	307, 023	139, 228	8.3	45.3
New Jersey.....	85, 536	24, 789	1.5	29.0
Pennsylvania.....	277, 160	105, 799	6.2	38.2
North Atlantic.....	917, 286	369, 396	22.0	40.3
Ohio.....	343, 144	76, 006	4.5	22.2
Indiana.....	275, 507	46, 969	2.8	17.0
Illinois.....	461, 494	77, 274	4.6	16.7
Michigan.....	220, 440	64, 999	3.9	29.5
Wisconsin.....	294, 907	139, 550	8.3	47.3
East North Central.....	1, 595, 492	404, 798	24.1	25.4
Minnesota.....	320, 469	88, 011	5.2	27.5
Iowa.....	528, 495	72, 701	4.3	13.8
Missouri.....	280, 669	46, 114	2.7	16.4
North Dakota.....	116, 196	20, 823	1.3	17.9
South Dakota.....	116, 397	18, 301	1.1	15.7
Nebraska.....	252, 449	31, 164	1.9	12.3
Kansas.....	282, 625	38, 648	2.3	13.7
West North Central.....	1, 897, 300	315, 762	18.8	16.6
Delaware.....	17, 677	3, 048	.2	17.2
Maryland.....	74, 929	18, 501	1.1	24.7
Virginia.....	162, 008	28, 295	1.7	17.5
West Virginia.....	60, 747	17, 910	1.1	29.5
North Carolina.....	305, 122	30, 826	1.8	10.1
South Carolina.....	134, 626	16, 266	.9	12.1
Georgia.....	207, 954	22, 924	1.4	11.0
Florida.....	112, 961	11, 884	.7	10.5
South Atlantic.....	1, 076, 024	149, 654	8.9	13.9
Kentucky.....	166, 433	30, 774	1.8	18.5
Tennessee.....	164, 023	29, 087	1.7	17.7
Alabama.....	174, 662	26, 182	1.6	15.0
Mississippi.....	186, 461	22, 339	1.3	12.0
Arkansas.....	154, 863	20, 094	1.2	13.0
Louisiana.....	137, 870	13, 490	.8	9.8
Oklahoma.....	209, 918	33, 435	2.0	15.9
Texas.....	550, 630	75, 181	4.5	13.7
South Central.....	1, 744, 860	250, 582	14.9	14.4
Montana.....	108, 961	10, 561	.6	9.7
Idaho.....	82, 464	12, 838	.8	15.6
Wyoming.....	44, 058	3, 991	.2	9.1
Colorado.....	104, 493	12, 845	.8	12.3
New Mexico.....	40, 904	4, 947	.3	12.1
Arizona.....	48, 156	4, 694	.3	9.7
Utah.....	40, 265	7, 433	.4	18.5
Nevada.....	11, 481	1, 642	.1	14.3
Washington.....	149, 021	30, 826	1.8	20.7
Oregon.....	103, 107	22, 819	1.4	22.1
California.....	537, 533	77, 837	4.6	14.5
Western.....	1, 270, 443	190, 433	11.3	15.0
United States.....	8, 506, 937	1, 680, 625	100.0	19.8

¹ Includes benefit payments and Government purchases of cattle and calves.

Compiled from reports of the Bureau of Agricultural Economics.

TABLE 56.—Date of institution of classified price plan in specified milk markets, 1918-35, inclusive

Market	Date plan was instituted in market (approximate)	Number of classes	Market	Date plan was instituted in market (approximate)	Number of classes
Boston, Mass.	1918	2	El Paso, Tex.	(?)	3
Twin City, Minn., (Minneapolis and St. Paul)	1918	2	Charleston, W. Va.	(?)	3
Baltimore, Md.	1919	2	Huntington, W. Va.	(?)	4
Philadelphia, Pa.	1920	3	Danville, Ill.	(?)	3
New York, N. Y.	1921	6	Cedar Rapids, Iowa	(?)	3
Milwaukee, Wis.	1921	2	Ann Arbor, Mich.	(?)	2
Connecticut markets	1922	5	Battle Creek, Mich.	(?)	3
Pittsburgh, Pa.	1922	5	Bay City, Mich.	(?)	3
Detroit, Mich.	1923	2	Des Moines, Iowa	(?)	2
Los Angeles, Calif.	1923	2	Dubuque, Iowa	(?)	4
Washington, D. C.	1924	2	Evansville, Ind.	(?)	3
Peoria, Ill.	1926	2	Fall River, Mass.	(?)	2
Muskegon, Mich.	1929	3	Fort Worth, Tex.	(?)	2
Chicago, Ill.	1929	2	Indianapolis, Ind.	(?)	3
San Francisco, Calif.	1929	2	Kalamazoo, Mich.	(?)	3
St. Louis, Mo.	1930	3	Lansing, Mich.	(?)	3
Decatur, Ill.	1930	3	Lincoln, Nebr.	(?)	2
Bloomington, Ill.	1930	4	New Bedford, Mass.	(?)	2
Kansas City, Mo.	1930	3	Newport, R. I.	(?)	2
Champaign, Ill.	1931	4	Omaha-Council Bluffs, Nebr.	(?)	2
Phoenix, Ariz.	1931	3	Iowa	(?)	(?)
Cincinnati, Ohio	1931	3	Port Huron, Mich.	(?)	2
Alameda County (Oakland), Calif.	1931	2	Providence, R. I.	(?)	2
Falls Cities (Louisville, Ky.; New Albany and Jeffersonville, Ind.)	1931	3	Quad Cities, Ill.	(?)	2
Atlanta, Ga.	1932	3	Richmond, Va.	(?)	2
Grand Rapids, Mich.	1932	3	Saginaw, Mich.	(?)	3
Southern Illinois markets	1932	3	Savannah, Ga.	(?)	2
San Diego, Calif.	1932	2	Sioux City, Iowa	(?)	4
Rockford, Ill.	1933	2	Topeka, Kans.	(?)	3
Denver, Colo.	1933	3	Tucson, Ariz.	(?)	3
Cleveland, Ohio	(?)	2	Tulsa, Okla.	(?)	2
Columbus, Ohio	(?)	2	Wichita, Kans.	(?)	3
Flint, Mich.	(?)	2	Knoxville, Tenn.	(?)	3
Fort Wayne, Ind.	(?)	3	Seattle, Wash.	(?)	2
Oklahoma City, Okla.	(?)	2	Total number of markets		68

¹ As many as 9 classes at times.

² No date indicated.

³ Some classification indicated.

The information given in this table was taken from numerous published sources and from transcripts of hearings on Federal licenses or orders.

TABLE 57.—Fluid-milk sales ¹ of Maryland State Dairymen's Association, December 1923-December 1931

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.	1,000 gals.
1923													1,269
1924	1,171	1,207	1,230	1,237	1,262	1,254	1,262	1,287	1,313	1,367	1,368	1,348	1,275
1925	1,347	1,388	1,428	1,445	1,489	1,552	1,491	1,439	1,525	1,578	1,508	1,490	1,468
1926	1,476	1,489	1,517	1,530	1,592	1,570	1,539	1,490	1,544	1,582	1,510	1,481	1,525
1927	1,480	1,512	1,549	1,536	1,562	1,558	1,538	1,485	1,554	1,598	1,562	1,558	1,541
1928	1,527	1,549	1,571	1,549	1,595	1,562	1,517	1,481	1,506	1,575	1,555	1,514	1,542
1929	1,517	1,526	1,547	1,551	1,673	1,566	1,528	1,495	1,571	1,575	1,555	1,510	1,551
1930	1,497	1,507	1,543	1,534	1,592	1,561	1,517	1,493	1,587	1,469	1,509	1,465	1,523
1931	1,434	1,450	1,431	1,470	1,491	1,462	1,435	1,407	1,468	1,457	1,414	1,376	1,441

¹ Adjusted to 30-day month.

Compiled from History of Maryland State Dairymen's Association, History Series No. 2, National Cooperative Milk Producer's Federation, appendix, table 6.

TABLE 58.—*Indices of seasonal variation in fluid milk sales by distributors purchasing from cooperative associations*

Month	Balti- more	Boston	Twin Cities	Month	Balti- more	Boston	Twin Cities
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>		<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
January.....	97.7	96.9	98.8	August.....	96.4	103.1	99.1
February.....	98.6	97.6	101.0	September.....	100.5	100.5	100.1
March.....	100.2	98.6	101.4	October.....	103.0	100.4	102.5
April.....	100.4	97.2	101.8	November.....	101.0	100.7	101.7
May.....	103.1	99.5	99.5	December.....	98.7	95.9	98.0
June.....	101.4	102.8	98.1				
July.....	99.0	106.8	98.0	Average.....	100.0	100.0	100.0

Indices were calculated by the median-link relative method from data of fluid-milk sales, omitting those months in which price changes occurred.

TABLE 59.—*Retail prices of milk per quart, delivered, in Baltimore, 1907-86*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aver- age
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907.....	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	9.0	8.3	8.3
1908.....	9.0	9.0	9.0	8.7	8.7	8.7	8.7	8.7	8.7	8.7	9.0	8.8	8.8
1909.....	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
1910.....	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.8	8.6	8.6
1911.....	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
1912.....	8.6	8.6	8.6	8.6	8.6	8.6	8.7	8.7	8.7	8.7	8.8	8.8	8.7
1913.....	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.7	8.7	8.7	8.8
1914.....	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
1915.....	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
1916.....	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
1917.....	9.2	9.2	9.2	9.2	11.0	10.8	10.8	10.8	11.7	11.7	12.0	12.8	10.7
1918.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	16.0	16.0	17.0	17.0	15.6
1919.....	17.0	16.0	15.0	14.2	14.0	14.0	14.0	15.0	15.5	16.0	16.0	16.0	15.2
1920.....	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.9
1921.....	15.0	15.0	14.0	14.0	14.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	13.0
1922.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	13.0	12.1
1923.....	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	14.0	14.0	13.0	13.0	13.0
1924.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1925.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1926.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	13.3
1927.....	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1928.....	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1929.....	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1930.....	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1931.....	14.0	14.0	14.0	13.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.6
1932.....													11.3
1933.....	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	10.6
1934.....	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
1935.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1936.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	13.0	13.0	12.2

Compiled from reports of the Bureau of Labor Statistics.

TABLE 60.—*Monthly fluid-milk sales¹ by large dealers in Boston, 1922-31*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Aver- age
	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>	<i>Mill. lb.</i>
1922.....	21.4	21.7	22.0	21.5	22.8	23.9	23.4	22.9	22.6	22.5	22.7	21.3	22.4
1923.....	22.0	22.4	23.0	22.6	23.6	25.6	24.5	23.7	23.2	23.6	23.5	22.6	23.4
1924.....	22.9	23.1	24.1	24.5	25.2	26.2	27.2	26.1	24.6	24.1	24.4	23.8	24.7
1925.....	24.2	24.6	25.2	25.2	25.5	28.0	27.2	26.3	25.7	25.8	26.1	25.4	25.8
1926.....	25.9	26.1	26.5	26.5	27.0	27.6	28.9	27.5	27.2	28.4	28.4	26.6	27.2
1927.....	27.2	27.8	28.6	28.4	27.9	29.0	29.8	28.2	28.2	28.7	28.1	27.8	28.3
1928.....	28.7	29.0	29.5	28.9	29.5	29.9	31.3	31.4	29.4	30.6	31.1	29.8	29.9
1929.....	30.5	30.8	31.5	31.0	32.0	32.8	31.7	31.0	30.4	30.7	29.1	31.2	31.2
1930.....	29.6	30.0	30.4	30.2	31.2	31.4	30.5	29.7	30.6	29.7	29.1	28.2	30.1
1931.....	30.0	29.6	30.2	29.9	31.8	30.2	31.6	30.6	30.1	30.3	29.7	28.5	30.2

¹ Adjusted to 30-day month.

Data supplied by W. H. Bronson of the New England Milk Producers' Association.

TABLE 61.—*Retail prices¹ of milk per quart, delivered, in Boston, 1922-31*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1922.....	13.5	13.5	13.5	12.5	12.5	12.5	13.5	13.5	13.5	14.5	14.5	14.5
1923.....	14.5	14.5	14.5	13.5	13.5	13.5	14.0	14.5	14.5	14.5	15.5	15.0
1924.....	14.5	13.5	12.5	12.0	12.0	12.0	{ 12.5 13.5 }	13.5	14.5	14.5	14.5	14.5
1925.....	14.5	14.5	13.5	13.5	13.0	13.0	14.0	14.5	14.5	14.5	14.5	14.5
1926.....	14.5	14.5	14.5	14.5	14.5	13.5	14.5	14.5	14.5	14.5	{ 14.5 15.0 }	14.0
1927.....	14.0	14.0	14.0	14.0	14.0	14.0	{ 14.0 15.0 }	15.0	{ 15.0 15.5 }	15.5	{ 15.5 16.5 }	16.5
1928.....	16.0	15.5	15.5	14.5	14.5	14.5	{ 14.5 15.5 }	15.5	15.5	15.5	15.5	15.5
1929.....	15.5	15.5	15.5	15.5	15.5	14.5	15.5	15.5	15.5	15.5	15.5	15.5
1930.....	15.5	15.5	15.5	15.5	{ 14.5 15.5 }	14.5	{ 14.5 15.5 }	15.5	15.5	15.5	15.5	{ 13.5 15.5 }
1931.....	13.5	12.5	12.5	12.5	12.5	12.5	12.5	13.5	13.5	13.5	13.5	{ 10.0 12.5 }

¹ During the period Apr. 1, 1923, to Sept. 4, 1927, some dealers' prices were ½ cent higher than the prices indicated above.

Data supplied by W. H. Bronson of the New England Milk Producers' Association.

TABLE 62.—*Fluid-milk sales¹ to distributors by the Twin City Milk Producers, Association, 1924-32*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>	<i>1,000 lb.</i>
1924.....	11,098	11,541	11,279	11,876	11,720	11,814	11,871	11,799	11,788	12,318	12,225	11,843
1925.....	11,958	12,265	12,572	12,710	11,720	12,572	12,210	12,570	13,052	12,492	12,421	11,861
1926.....	12,079	12,178	12,246	12,331	12,522	12,170	12,004	11,990	11,988	12,368	12,293	12,002
1927.....	12,246	12,485	13,775	12,474	12,005	11,912	11,769	12,111	12,737	12,438	12,608	12,100
1928.....	12,480	12,634	12,782	12,729	12,919	12,238	12,270	12,436	12,439	13,607	13,406	12,644
1929.....	12,785	12,942	12,968	13,086	12,820	12,437	12,432	12,684	13,053	13,495	13,433	12,980
1930.....	13,256	13,571	13,648	13,646	13,119	13,004	13,142	13,097	13,346	13,543	13,487	12,860
1931.....	12,961	13,277	13,201	13,268	13,821	12,842	12,993	12,162	12,568	12,808	12,724	12,065
1932.....	12,203	12,543	12,543	12,724	12,288	12,534	12,571	12,717	12,771	12,612	12,093	11,862

¹ Adjusted to 30-day month.

Computed from data in Twin City Milk Producers' Association, History Series No. 7, National Cooperative Milk Producers' Federation, appendix, table 4.

TABLE 63.—*Retail prices of milk per quart in Twin Cities, 1924-32*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1924.....	11-12	11-12	11-12	10	10	10	10	11	11	11	11	11
1925.....	11	11	11	11	11	11	11	11	12	12	12	12
1926.....	11-12	11	11	11	11	11	11	11	11	11	11	10-11
1927.....	10-11	11	11	11	11	11	11	11	11-12	12	12	12
1928.....	12	12	12	12	12	12	12	12	12	12	12	12
1929.....	12	12	12	12	12	12	12	12	12	12	12	12
1930.....	11	11	11	11	11	11	11	11	11	11	10-11	10
1931.....	10	10	10	10	10	10	10	10	10	10	10	9-10
1932.....	9-10	8-10	8-9	8-9	8-9	8-9	8	8	8	8	8	8

Data supplied by the Twin City Milk Producers' Association.

TABLE 64.—*Sales and retail prices of fluid milk in the Boston sales area*

Year and month	Class I sales of milk	Milk reported as percent of estimated total sales	Estimated total Class I sales ¹	Estimated average daily Class I sales	Retail delivered price per quart	Retail store price per quart	Class I price per hundred-weight of 3.7 percent milk f. o. b. city
	1,000 pounds	Percent	1,000 pounds	1,000 pounds	Cents	Cents	Dollars
April..... 1934	39, 527	93. 2	42, 411	1, 414	11	10	2. 95
May.....	38, 327	86. 4	44, 369	1, 431	11	10	2. 95
June.....	41, 046	93. 8	43, 771	1, 459	11	10	2. 95
July.....	47, 067	95. 9	49, 100	1, 584	11	10	2. 95
August.....	44, 023	95. 5	46, 101	1, 487	11	10	2. 95
September.....	42, 445	95. 5	44, 456	1, 482	11	10	2. 95
October.....	44, 303	95. 9	46, 207	1, 491	12	11	3. 28
November.....	42, 714	94. 6	45, 165	1, 506	12	11	3. 26
December.....	42, 227	94. 4	44, 725	1, 443	12	11	3. 26
January..... 1935	43, 038	95. 1	45, 246	1, 460	12	11	3. 26
February.....	38, 179	94. 8	40, 281	1, 439	12	11	3. 30
March.....	42, 573	95. 6	44, 542	1, 437	13	12	3. 49
April.....	40, 122	94. 5	42, 453	1, 415	13	12	3. 49
April to September.....				1, 476	11		
October to February.....				1, 468	12		
Percent change.....				-0. 5	+9. 1		
March and April.....				1, 426	13		
Percent change.....				-2. 9	+8. 3		

¹ Preliminary.

Sales and class I prices: Compiled from reports of the Market Administrator. Retail prices: Compiled from reports of the Bureau of Agricultural Economics.

TABLE 65.—*Sales and retail prices of fluid milk in the Detroit sales area*

Year and month	Class I sales of milk	Milk reported as percent of estimated total sales	Estimated total Class I sales ¹	Estimated average daily Class I sales	Retail delivered price per quart	Retail store price per quart	Class I price per hundred-weight of 3.5 percent milk f. o. b. city
	1,000 pounds	Percent	1,000 pounds	1,000 pounds	Cents	Cents	Dollars
April..... 1934	35, 448	98. 6	35, 967	1, 199	10	10	2. 02
May.....	37, 853	98. 9	38, 269	1, 235	10	10	2. 02
June.....	35, 957	99. 0	36, 336	1, 211	10	10	2. 15
July.....	35, 496	99. 0	35, 846	1, 156	11	11	2. 25
August.....	34, 544	99. 0	34, 674	1, 119	11	11	2. 25
September.....	33, 731	98. 8	34, 150	1, 133	11	11	2. 25
October.....	34, 776	99. 1	35, 097	1, 132	11	11	2. 25
November.....	33, 419	98. 2	34, 027	1, 134	11	11	2. 38
December.....	33, 671	98. 2	34, 295	1, 106	11	11	2. 27
January..... 1935	34, 804	98. 0	35, 522	1, 146	11	11	2. 25
February.....	31, 948	97. 8	32, 654	1, 166	11	11	2. 40
March.....	35, 868	98. 2	36, 544	1, 178	12	12	2. 48
April to June.....				1, 215	10		
July to February.....				1, 137	11		
Percent change.....				-6. 4	+10. 0		
March.....				1, 178	12		
Percent change.....				-3. 6	+9. 1		

¹ Preliminary.

Sales and class I prices: Compiled from reports of Market Administrator. Retail prices: Compiled from reports of the Bureau of Agricultural Economics.

TABLE 66.—Sales and retail prices of fluid milk in the Evansville sales area

Year and month	Class I sales of butterfat	Milk reported as percent of estimated total sales	Estimated total class I sales of butterfat ¹	Estimated average daily class I sales of milk equivalent	Retail delivered price per quart	Retail store price per quart	Class I price per pound butterfat f. o. b. city
<i>1934</i>	<i>Pounds</i>	<i>Percent</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
March.....	55,017	90	61,130	51,893	8.3	8.2	48.0
April.....	47,589	90	52,877	46,383		9	48.0
May.....	46,979	87	53,999	45,840	9.0		48.0
June.....	46,210	85	54,365	47,689	9.0	8-9	48.0
July.....	47,767	95	50,281	42,683	9.0	8-9	48.0
August.....	45,008	90	50,009	42,452	9.0	8-9	48.0
September.....	40,557	89	45,775	40,154	9.0	8-9	48.0
October.....	42,407	87	48,744	41,404	9.5	9-10	48.0
November.....	41,153	89	46,239	40,561	9.5	9-10	51.5
December.....	41,184	88	46,800	39,728	9.5	9-10	53.0
<i>1935</i>							
January.....	43,351	90	48,168	40,890	9.5	9-10	53.0
February.....	40,059	88	45,522	42,784	9.5	9-10	53.0
March.....	45,090	89	50,663	44,441	9.5	9-10	53.0
May to September.....				43,764	9		
October to March.....				41,635	9.5		
Percent change.....				-4.9	+5.6		

¹ Preliminary.

Percentage changes from March sales and prices were not calculated, since sales during that month appear to have been unduly high.

Sales and class I prices: Compiled from reports of Market Administrator. Retail prices: Compiled from reports of the Bureau of Agricultural Economics.

TABLE 67.—Sales and retail prices of fluid milk in the Grand Rapids sales area

Year and month	Class I sales of milk	Milk reported as percent of estimated total class I sales	Estimated total class I sales ¹	Estimated average daily class I sales	Retail delivered price per quart	Retail store price per quart	Class I price per hundred-weight of 3.5 percent milk f. o. h. city
<i>1934</i>	<i>Pounds</i>	<i>Percent</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>
August.....	3,938,012	93.5	4,213,973	135,935	9	9.0	1.85
September.....	3,820,455	93.7	4,075,256	135,842	9	9.5	1.85
October.....	3,995,478	94.4	4,230,868	136,480	10	10.0	1.85
November.....	3,861,000	94.5	4,083,719	136,124	10	10.0	2.10
December.....	3,872,318	94.5	4,095,636	132,117	10	10.0	2.10
<i>1935</i>							
January.....	3,909,792	94.5	4,138,024	133,485	10	10.0	2.10
February.....	3,584,821	95.2	3,766,149	134,505	10	10.0	2.10
March.....	3,928,663	94.4	4,161,551	134,244	10	10.0	2.10
August to September.....				135,888	9		
October to March.....				134,492	10		
Percent change.....				-1.03	+11.1		

¹ Preliminary.

Sales and class I prices: Compiled from reports of Market Administrator. Retail prices: Compiled from reports of the Bureau of Agricultural Economics.

TABLE 68.—*Sales and retail prices of fluid milk in the Kalamazoo sales area*

Year and month	Class I sales of milk	Milk reported as percent of estimated total class I sales	Estimated total class I sales ¹	Estimated average daily class I sales	Retail delivered and prices per quart	Class I price per hundred-weight of 3.5 percent milk f. o. h. city
<i>1934</i>	<i>Pounds</i>	<i>Percent</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Cents</i>	<i>Dollars</i>
July.....	1, 236, 034	91.9	1, 344, 615	43, 375	10	1.85
August.....	1, 129, 712	87.6	1, 289, 236	41, 588	10	1.85
September.....	1, 043, 354	87.3	1, 194, 501	39, 817	10	1.85
October.....	1, 078, 938	81.8	1, 318, 982	42, 548	10	1.85
November.....	1, 062, 866	83.1	1, 279, 549	42, 652	10	1.85
December.....	1, 145, 373	82.6	1, 386, 190	44, 716	18	1.85
<i>1935</i>						
January.....	1, 211, 198	85.5	1, 417, 112	45, 713	8	1.85
February.....	1, 144, 550	83.3	1, 295, 960	46, 284	8	1.85
March.....	1, 196, 868	87.6	1, 366, 165	44, 070	10	2.00
July to November.....				41, 996		
December to February.....				45, 571	8	
Percent change.....				+8.5	-20.0	
March.....				44, 070	10	
Percent change.....				-3.3	+25.0	

¹ Preliminary

Sales and class I prices: Compiled from reports of Market Administrator. Retail prices: Compiled from reports of the Bureau of Agricultural Economics.

TABLE 69.—*Daily fluctuation in sales of milk and cream in the New York metropolitan area, 1924*

Type of sale	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Retail sales of milk:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Quarts, grade B.....	103.7	99.5	99.6	99.8	99.2	99.3	98.9
Quarts, grade A.....	100.5	100.0	100.2	100.3	99.8	99.8	99.4
Quarts, certified.....	98.9	100.9	99.8	100.6	100.6	100.3	98.9
Quarts, huttermilk.....	76.4	106.9	106.5	106.3	102.9	106.5	94.5
Pints, grade B.....	77.6	106.8	106.9	108.0	108.0	107.2	85.5
Half pints, condensed.....	106.0	96.9	99.0	105.8	93.8	94.7	103.8
Retail sales of cream:							
Half pints, light.....	108.0	98.0	99.7	103.5	97.8	96.6	96.4
Half pints, extra heavy.....	176.3	83.4	88.8	92.3	86.2	82.1	90.9
Wholesale sales of milk:							
Quarts, grade B.....	92.8	99.4	100.8	99.6	100.8	102.2	104.4
Pints, grade B.....	46.8	115.2	116.8	115.7	118.4	115.9	71.2
Bulk, grade B.....	73.5	107.3	103.1	104.2	104.3	107.2	100.4
Condensed milk.....	42.7	114.5	86.9	93.4	83.6	130.6	148.3
Buttermilk.....	34.4	126.5	106.0	109.2	114.4	115.0	94.5
Wholesale sales of cream:							
Light.....	42.3	118.9	95.6	93.7	94.9	121.8	132.8
Extra heavy.....	72.9	107.7	88.9	91.4	86.6	112.2	140.3

Compiled from Ross, H. A., Some Factors Affecting the Demand for Milk and Cream in the Metropolitan Area of New York, Technical Bulletin No. 73, U. S. Department of Agriculture.

TABLE 70.—*Daily fluctuation in retail, wholesale, and total sales of fluid milk and cream in Reading, Pa.*

Type of sale	Percentage of average daily sales for the week						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Milk:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Retail.....	107.49	95.18	98.62	98.54	99.01	99.18	101.97
Wholesale.....	61.36	106.27	102.46	102.86	104.50	115.20	107.35
Total.....	91.90	98.93	99.92	100.00	100.86	104.60	103.79
Cream:							
Retail.....	136.07	87.18	99.62	96.63	87.51	85.99	107.01
Wholesale.....	77.21	102.33	96.32	111.62	105.01	95.83	111.67
Total.....	112.91	93.14	98.32	102.53	94.40	89.87	108.84

Compiled from, Cowden, T. K., Distribution and Consumption of Milk in Reading, Pa., Technical Bulletin No. 614, Pennsylvania Agricultural Experiment Station.

TABLE 71.—*Daily fluctuation¹ in sales of certain dairy products in Chicago and suburbs*

Type of sale	Sunday	Monday	Tues- day	Wednes- day	Thurs- day	Friday	Satur- day
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Milk.....quarts.....	104.7	97.2	99.9	99.3	100.4	100.4	100.0
Milk.....pints.....	64.3	100.8	104.2	104.9	104.4	105.2	81.3
22 percent cream.....half pints.....	153.7	93.7	100.7	99.3	103.1	97.6	99.3
32 percent cream.....do.....	311.9	76.4	88.1	96.3	107.3	93.0	115.3

¹ Based on average retail sales to more than 200,000 families during the 3-year period 1920-22. Average sales for the 5 days, Tuesday, Wednesday, Thursday, Friday, and Saturday=100 percent.

Compiled from Ross, H. A., The Marketing of Milk in the Chicago Dairy District, Illinois Agricultural Experiment Station Bulletin No. 269.

TABLE 72.—*Daily fluctuation in sales and receipts of milk and cream for the Pittsburgh market during the last 2 weeks of July 1933¹*

Type of sale	Percentage of average daily sales for the week						
	Sunday	Mon- day	Tues- day	Wednes- day	Thurs- day	Friday	Satur- day
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Regular fluid milk.....	76.25	105.16	102.56	100.69	102.01	109.44	103.90
Special fluid milk.....	95.09	97.74	103.66	97.06	105.17	96.31	104.96
Total fluid milk.....	76.67	104.99	102.58	100.61	102.08	109.15	103.92
Fluid cream.....	92.36	92.41	100.60	93.22	105.57	99.82	116.02
Dealer purchases of milk and cream.....	98.35	97.26	100.21	102.83	101.31	98.55	101.48

¹ Based on reports received from 35 dealers handling 77 percent of the fluid-milk sales in the market.

Compiled from Cowden, T. K., and Gifford, C. G., The Distribution and Consumption of Milk in Allegheny County, Pa., Technical Paper No. 641, Pennsylvania Agricultural Experiment Station.

TABLE 73.—*Daily fluctuation in the sales of milk and cream in Williamsport, Pa., March, April, and May, 1933*

Type of sale	Percentage of average daily sales for the week						
	Sunday	Mon- day	Tues- day	Wednes- day	Thurs- day	Friday	Satur- day
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Milk:							
Retail.....	102.35	97.81	99.99	100.04	99.71	99.69	100.40
Wholesale.....	65.86	104.23	102.25	105.63	105.70	111.06	105.25
Total.....	94.94	99.17	100.80	101.15	100.76	102.97	101.09
Cream:							
Retail.....	138.75	87.51	97.81	96.18	90.10	88.15	101.52
Wholesale.....	88.92	95.85	93.73	102.59	93.77	106.94	118.20
Total.....	111.75	93.14	95.16	98.23	92.46	99.07	110.19

Compiled from Cowden, T. K., Distribution and Consumption of Milk in Williamsport, Pa., Station Technical Paper No. 615, Pennsylvania Agricultural Experiment Station.

TABLE 74.—All milk handled by the Twin Cities Milk Producers' Association and sales of fluid milk to distributors by the association, 1928 to 1932, inclusive

Month	1928			1929			1930		
	All milk	Fluid sales	Percent of all milk	All milk	Fluid sales	Percent of all milk	All milk	Fluid sales	Percent of all milk
	Million gallons	Million gallons		Million gallons	Million gallons		Million gallons	Million gallons	
January.....	26.1	12.9	49.4	28.4	13.2	46.5	32.6	13.7	42.0
February.....	26.2	12.2	46.6	27.0	12.1	44.8	31.2	12.7	40.7
March.....	28.8	13.2	45.8	31.3	13.4	42.8	35.5	14.1	39.7
April.....	27.5	12.7	46.2	31.0	13.1	42.3	35.0	13.6	38.9
May.....	31.9	13.3	42.0	35.4	13.2	37.3	40.1	13.6	33.9
June.....	32.7	12.2	37.3	36.9	12.4	33.6	37.7	13.0	34.5
July.....	28.4	12.7	44.7	32.0	12.8	40.0	30.5	13.6	44.6
August.....	24.4	12.8	52.5	25.8	13.1	50.8	25.3	13.5	53.4
September.....	21.6	12.4	57.4	22.4	13.0	58.0	22.2	13.3	59.9
October.....	20.4	14.1	69.1	24.0	13.9	57.9	24.6	14.0	56.9
November.....	21.7	13.4	61.8	24.7	13.4	54.2	25.7	13.5	52.5
December.....	25.5	13.1	51.4	28.9	13.4	46.4	30.3	13.3	43.9
Total.....	315.2	155.0	49.2	347.8	157.0	45.1	370.7	161.9	43.7

Month	1931			1932		
	All milk	Fluid sales	Percent of all milk	All milk	Fluid sales	Percent of all milk
	Million gallons	Million gallons		Million gallons	Million gallons	
January.....	34.3	13.4	39.1	35.0	12.6	36.0
February.....	33.0	12.4	37.6	33.8	12.1	35.8
March.....	36.2	13.6	37.6	36.0	13.0	36.1
April.....	32.6	13.3	40.8	33.5	12.7	37.9
May.....	36.2	13.2	36.5	38.6	12.7	32.9
June.....	34.0	12.8	37.6	34.2	12.5	36.5
July.....	27.4	13.4	48.9	25.7	13.0	50.6
August.....	24.0	12.6	52.5	22.4	13.1	58.5
September.....	21.8	12.6	57.8	21.9	12.8	58.4
October.....	25.2	13.2	52.4	24.4	13.0	53.3
November.....	26.8	12.7	47.4	26.6	12.1	45.5
December.....	31.7	12.5	39.4	31.5	12.1	38.4
Total.....	363.2	155.7	42.9	363.6	151.7	41.7

Compiled from Twin City Milk Producers' Association, History Series No. 7, the National Cooperative Milk Producers' Federation, appendix, tables 3 and 4.

TABLE 75.—Daily average purchases, sales, and surplus of pasteurized milk, reported by 17 distributors and the surplus plant, Los Angeles, Calif., August 1929 to August 1930, inclusive

Year and month	Distributors				Surplus plant (net surplus pounds)	Total surplus	
	Purchases (pounds of milk fat)	Sales (pounds of milk fat)	Surplus			Pounds of milk fat	Percent of purchases
			Pounds of milk fat	Percent of purchases			
1929							
August	38,042	31,000	7,042	18.5		7,042	18.5
September	38,747	31,133	7,614	19.7		7,614	19.7
October	38,888	31,811	7,077	18.2		7,077	18.2
November	40,071	31,860	8,211	20.5		8,211	20.5
December	40,445	31,383	9,062	22.4		9,062	22.4
1930							
January	39,605	30,024	9,581	24.2	658	10,239	25.4
February	39,172	30,313	8,859	22.6	2,474	11,333	27.2
March	39,023	29,833	9,190	23.6	3,662	12,852	30.1
April	38,253	30,252	8,001	20.9	3,516	11,517	27.6
May	37,066	29,056	8,010	21.6	4,677	12,687	30.4
June	36,625	29,071	7,554	20.6	6,165	13,719	32.1
July	36,145	29,381	6,764	18.7	5,432	12,196	29.3
August	36,804	29,957	6,847	18.6	4,240	11,087	27.0
Average 1	38,404	30,340	8,064	21.0			

¹ Average for 12 months, September 1929 to August 1930, inclusive.

Compiled from Spencer, Leland, An Economic Survey of the Los Angeles Milk Market, University of California, Agricultural Experiment Station Bulletin No. 613, table 15.

TABLE 76.—*Purchases and sales of fluid milk by large Boston dealers purchasing from the New England Milk Producers' Association, average monthly for the period 1919-28, inclusive*

Month	Pur- chases	Fluid- milk sales	Sales as percent of purchases	Month	Pur- chases	Fluid- milk sales	Sales as percent of purchases
	<i>Million pounds</i>	<i>Million pounds</i>			<i>Million pounds</i>	<i>Million pounds</i>	
January.....	36.8	23.5	63.9	August.....	39.2	25.2	64.3
February.....	38.9	23.7	60.9	September.....	36.8	24.3	66.0
March.....	42.3	24.1	57.0	October.....	36.6	24.5	66.9
April.....	46.5	24.1	51.8	November.....	33.3	24.4	73.3
May.....	51.2	24.5	47.9	December.....	35.6	23.7	66.6
June.....	56.6	25.9	45.8				
July.....	47.0	26.3	56.0	Average.....	41.7	24.5	58.8

Compiled from data supplied by the New England Milk Producers' Association.

TABLE 77.—*Seasonal variation in average monthly amount of surplus milk handled by 2 companies during the 3-year period 1920 to 1922, Chicago, Ill.*

Month	Company A		Company B	
	Surplus ex- pressed as percent of total milk purchased	Percentage variation when aver- age surplus for 36 months=100 percent ¹	Surplus ex- pressed as percent of total milk purchased	Percentage variation when aver- age surplus for 36 months=100 percent
January.....	33.7	104.4	17.4	64.6
February.....	36.9	122.2	20.0	74.5
March.....	38.7	132.6	25.9	100.7
April.....	39.9	137.5	32.0	131.4
May.....	45.3	170.6	42.7	198.4
June.....	43.5	162.9	42.5	195.3
July.....	30.9	87.2	33.3	123.0
August.....	25.9	64.4	30.6	105.3
September.....	18.1	40.7	23.5	77.2
October.....	20.4	48.2	18.8	58.9
November.....	20.4	49.9	12.8	32.7
December.....	28.9	79.4	14.1	37.5
Total.....	32.8	100.0	27.3	100.0

¹ Corrected for secular trend.

Compiled from Ross, H. A., *The Marketing of Milk in the Chicago Dairy District*, University of Illinois, Agricultural Experiment Station Bulletin No. 269, table 33.

TABLE 78.—*Retail prices per quart of milk delivered in New York, N. Y., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	8.0		8.1		8.0		8.0		8.0		8.2		8.0
1908	8.1		8.0		8.0		8.0		8.0		8.4		8.1
1909	8.0		8.0		8.0		8.0		8.0		8.9		8.2
1910	8.8		8.4		8.2		8.3		8.9		9.0		8.6
1911	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
1912	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	9.0	9.0	9.0	8.9
1913	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1914	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1915	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1916	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.8	9.8	9.9	9.2
1917	10.0	10.9	10.9	10.9	10.9	10.9	11.4	12.5	12.4	13.8	14.0	14.0	11.9
1918	15.0	14.6	14.6	14.0	13.0	12.8	12.7	14.0	14.0	15.6	17.0	17.0	14.5
1919	16.0	16.0	15.5	15.5	15.7	15.0	16.0	16.0	16.0	16.0	17.7	18.0	16.1
1920	18.0	16.7	16.7	15.0	15.0	15.0	16.0	17.0	18.0	18.0	18.0	17.0	16.7
1921	17.0	16.0	15.0	15.0	15.0	14.3	14.0	15.0	15.0	15.0	15.0	15.0	15.1
1922	15.0	15.0	15.0	14.0	13.0	13.0	14.0	15.0	15.0	15.0	15.0	16.0	14.6
1923	16.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	15.0	15.3	15.0	15.0	14.8
1924	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	13.8
1925	15.0	15.0	15.0	15.0	15.0	14.0	14.0	15.0	15.0	15.0	15.0	15.0	14.8
1926	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1927	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0	16.0	15.3
1928	16.0	16.0	15.0	15.0	15.0	15.0	15.5	16.0	16.0	16.0	16.0	16.0	15.6
1929	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1930	16.0	16.0	16.0	16.0	15.0	15.0	15.0	16.0	16.0	16.0	16.0	15.0	15.7
1931	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0		14.7
1932													11.9
1933	11.0	10.0	10.0	10.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	11.2
1934	12.0	12.0	12.0	12.2	12.0	12.5	12.7	12.5	12.5	12.5	12.5	12.5	12.3
1935	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
1936	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	13.0	13.0	13.0	13.1

Compiled from reports of the Bureau of Labor Statistics.

TABLE 79.—*Retail prices per quart of milk delivered in Boston, Mass., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	8.0		8.0		8.0		8.0		8.0		9.0		8.2
1908	8.7		8.7		8.0		8.0		8.0		8.3		8.3
1909	8.3		8.3		8.0		8.0		8.3		8.7		8.3
1910	8.8		8.8		8.2		8.8		9.0		9.0		8.8
1911	9.0	9.0	9.0	8.0	8.0	8.0	8.8	8.8	9.0	8.8	8.8	8.8	8.6
1912	8.8	8.8	8.8	8.8	9.0	8.8	8.8	8.5	8.8	8.9	8.9	8.9	8.8
1913	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
1914	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
1915	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	9.0	8.9	8.9
1916	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	9.6	9.6	9.6	9.1
1917	10.0	10.5	10.5	11.0	11.0	11.0	12.0	13.0	13.0	13.0	14.0	14.0	11.9
1918	14.5	14.5	14.5	14.5	14.5	14.0	14.5	15.0	15.0	15.8	16.5	16.5	15.0
1919	16.5	16.5	16.5	15.5	15.5	15.0	15.0	15.4	16.0	16.4	17.0	17.0	16.0
1920	17.0	17.0	17.0	17.0	16.3	16.3	17.0	17.5	18.5	18.4	18.4	18.3	17.4
1921	17.3	16.5	16.0	15.5	15.3	15.3	15.2	15.9	15.5	15.4	15.4	15.4	15.7
1922	13.5	13.5	13.5	13.5	12.9	12.5	13.5	13.5	13.5	14.5	14.5	14.5	13.6
1923	14.5	14.5	14.5	13.9	13.9	13.9	14.4	14.9	14.9	14.9	15.9	15.4	14.6
1924	14.9	14.9	12.9	12.4	12.4	12.4	13.4	13.9	14.9	14.9	14.9	14.9	13.8
1925	14.9	14.9	13.8	13.8	13.3	13.3	14.3	14.8	14.8	14.8	14.8	14.8	14.4
1926	14.9	14.9	14.9	14.9	14.9	13.9	14.9	14.9	14.9	14.9	15.1	15.3	14.9
1927	14.3	14.3	14.4	14.4	14.4	14.4	14.3	15.0	15.5	15.5	15.5	16.5	14.9
1928	16.0	15.5	15.5	14.8	14.8	14.8	15.3	15.2	15.8	15.8	15.8	15.8	15.4
1929	15.5	15.5	15.5	15.5	15.5	14.5	15.6	15.6	15.8	15.8	15.8	15.6	15.5
1930	15.7	15.7	15.7	15.5	15.5	15.2	14.8	15.5	15.5	15.5	15.5	15.5	15.5
1931	13.5	12.5	12.5	12.5	12.5	12.5	12.5	13.0	13.0	13.7	13.7		12.7
1932													11.0
1933	11.0	10.0	10.0	10.0	10.0	11.3	11.3	12.0	12.0	12.0	12.0	12.0	11.1
1934	12.0	11.0	10.7	10.7	10.7	10.7	10.7	10.7	10.5	11.7	11.7	11.5	11.0
1935	11.7	11.8	12.4	12.7	12.7	12.7	11.8	11.7	11.7	11.7	11.7	11.7	12.0
1936	11.7	12.2	12.4	12.6	12.6	12.6	12.6	11.6	11.6	11.6	11.6	11.6	12.1

Compiled from reports of the Bureau of Labor Statistics.

TABLE 80.—*Retail prices per quart of milk delivered in Philadelphia, Pa., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1908	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1909	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1910	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1911	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1912	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1913	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1914	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1915	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1916	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.5	8.8	8.8	8.2
1917	9.0	9.0	9.0	9.0	9.0	9.0	11.0	11.0	11.0	11.0	12.2	12.2	10.2
1918	13.5	13.0	13.2	12.0	12.0	12.0	12.0	12.0	13.0	14.0	14.0	14.0	12.9
1919	14.0	14.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0	14.0	13.6
1920	14.0	14.0	14.0	14.0	14.0	14.0	14.0	15.0	15.0	15.0	15.0	13.0	14.3
1921	13.0	13.0	13.0	13.0	13.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.8
1922	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	11.3
1923	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.5
1924	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.3	12.0	12.0
1925	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1926	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.5	13.0	13.0	12.2
1927	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1928	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1929	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0	13.3
1930	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.3	12.9
1931	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0	-----	11.7
1932	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	10.1
1933	9.0	9.0	9.0	9.0	9.0	10.0	10.0	10.5	11.0	11.0	11.0	11.0	10.0
1934	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.8	12.7	12.7	11.4
1935	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
1936	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	11.2

Compiled from reports of the Bureau of Labor Statistics.

TABLE 81.—*Retail prices per quart of milk delivered in Chicago, Ill., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.3	7.3	7.2	7.2
1908	7.5	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.5	7.5	7.3	7.3
1909	7.6	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.8	7.8	7.4	7.4
1910	7.9	7.9	7.9	7.8	7.8	7.8	7.8	7.8	7.8	8.0	8.0	7.8	7.8
1911	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1912	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1913	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1914	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1915	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
1916	8.0	8.0	8.0	8.0	8.1	8.1	8.1	9.0	9.0	9.0	9.0	9.0	8.4
1917	9.0	9.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	12.9	11.9	11.9	10.3
1918	11.9	11.9	11.9	11.9	11.9	11.9	12.0	12.4	12.9	12.9	14.0	14.0	12.5
1919	14.0	14.0	13.0	13.0	13.0	14.0	14.0	15.0	15.0	15.0	15.0	15.1	14.2
1920	15.0	15.0	14.0	14.0	14.0	14.0	15.0	16.0	16.0	16.0	15.0	14.0	14.8
1921	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	12.3	12.0	12.0	12.0	13.4
1922	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1923	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.5
1924	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1925	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1926	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1927	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1928	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1929	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1930	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1931	13.3	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	-----	13.0
1932	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	11.2
1933	9.0	9.0	9.0	9.3	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	9.9
1934	11.0	9.5	9.0	8.0	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5
1935	10.3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.7	10.7
1936	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	11.4

Compiled from reports of the Bureau of Labor Statistics.

TABLE 82.—Retail prices per quart of milk delivered in Washington, D. C., 1907-36

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	8.0		8.0		8.0		8.0		8.0		9.0		8.2
1908	9.0		9.0		8.0		8.0		8.0		9.0		8.5
1909	9.0		9.0		8.0		8.0		8.0		9.0		8.5
1910	9.0		9.0		8.0		8.0		8.0		9.0		8.5
1911	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.4	8.4	9.0	9.0	9.0	8.6
1912	9.0	9.0	9.0	9.0	8.2	8.0	8.0	8.2	8.2	9.0	9.0	9.0	8.6
1913	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.2	9.0	9.0	9.0	8.6
1914	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	9.0	9.0	9.0	8.6
1915	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	9.0	9.0	9.0	8.6
1916	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	10.0	10.0	9.2
1917	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	14.0	14.0	14.0	11.2
1918	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.7	17.0	17.0	17.0	14.8
1919	17.0	17.0	17.0	16.0	14.0	14.0	14.3	15.0	15.0	18.0	18.0	18.0	16.1
1920	17.7	17.7	17.7	17.7	16.0	16.0	16.0	16.0	16.3	18.0	18.0	18.0	17.1
1921	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.2
1922	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	15.0	15.0	14.3
1923	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.3
1924	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.3
1925	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	15.0	15.0	15.0	14.3
1926	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	15.0	15.0	15.0	14.6
1927	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1928	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1929	15.0	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8
1930	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1931	15.0	15.0	15.0	14.7	14.0	14.0	14.0	14.0	14.0	14.0	14.0		14.3
1932													13.4
1933	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1934	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1935	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1936	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	13.2

Compiled from reports of the Bureau of Labor Statistics.

TABLE 83.—Retail prices per quart of milk delivered in Minneapolis, Minn., 1907-36

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	6.0		6.0		6.0		6.0		7.0		7.0		6.3
1908	7.0		7.0		7.0		7.0		7.0		7.0		7.0
1909	7.0		7.0		7.0		7.0		7.0		7.0		7.0
1910	7.0		7.0		7.0		7.0		8.0		8.0		7.3
1911	7.0	7.0	6.0	6.0	6.0	6.0	6.4	7.0	7.0	7.0	7.0	7.0	6.5
1912	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0	7.2
1913	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.7	8.0	8.0	8.0	7.4
1914	8.0	8.0	8.0	8.0	7.0	7.0	7.2	8.0	8.0	8.0	8.0	8.0	7.8
1915	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.8	7.8	7.8	7.8	7.4	7.5
1916	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0	8.0	8.6	7.5
1917	8.0	8.0	8.0	8.0	8.0	8.0	9.0	10.0	10.0	12.0	10.2	11.0	9.2
1918	11.0	11.0	11.0	10.0	10.0	10.0	10.0	11.0	11.0	12.8	13.0	13.0	11.2
1919	13.0	13.0	13.0	13.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0	13.0	12.8
1920	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0	13.0	13.3
1921	13.0	12.3	12.0	11.3	11.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	11.2
1922	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	10.3
1923	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	11.4
1924	12.0	12.0	12.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	10.9
1925	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	11.3
1926	11.7	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
1927	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	11.3
1928	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1929	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1930	12.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	11.0
1931	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		9.9
1932													8.1
1933	7.0	5.0	5.0	5.0	5.0	7.0	8.0	8.0	8.0	8.0	8.0	9.0	6.9
1934	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.5	10.0	10.0	9.0	9.0	9.2
1935	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1936	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	10.4

Compiled from reports of the Bureau of Labor Statistics.

TABLE 84.—Retail prices per quart of milk delivered in St. Paul, Minn., 1913-36

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1913.....						6.4	6.8	6.9	7.8	7.8	7.8	7.8	
1914.....	7.5	7.5	7.5	7.0	7.0	7.0	7.1	7.5	7.7	7.9	7.9	7.9	7.5
1915.....	7.9	7.7	7.3	7.0	6.9	6.9	7.0	7.3	7.6	7.7	7.3	7.3	7.4
1916.....	7.3	7.3	7.3	7.1	7.1	7.1	7.1	7.9	7.9	7.9	8.1	8.8	7.6
1917.....	8.8	8.8	8.8	8.8	8.8	8.8	8.8	10.0	10.0	12.0	10.3	10.0	9.5
1918.....	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.7	11.0	12.8	12.8	14.0	11.2
1919.....	13.7	13.0	13.0	12.0	11.7	11.7	11.7	13.0	13.0	13.0	13.0	13.0	12.7
1920.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0	14.0	13.4
1921.....	13.0	12.0	12.0	12.0	11.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	11.3
1922.....	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	10.3
1923.....	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	12.0	12.0	11.4
1924.....	12.0	11.0	11.0	10.5	10.5	10.5	10.5	11.0	11.0	11.0	11.0	11.0	10.9
1925.....	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.7	12.0	12.0	12.0	11.3
1926.....	11.7	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.1
1927.....	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	12.0	12.0	12.0	11.3
1928.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1929.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1930.....	12.0	11.3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	11.0
1931.....	10.0	9.7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0
1932.....													8.7
1933.....	8.0	7.7	6.3	6.3	6.3	7.0	8.0	8.0	8.0	8.0	8.0	9.0	7.6
1934.....	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.5	10.0	10.0	9.0	9.0	9.2
1935.....	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1936.....	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.9	10.9	10.9	10.9	11.0	10.4

Compiled from reports of the Bureau of Labor Statistics.

TABLE 85.—Retail prices per quart of milk delivered in St. Louis, Mo., 1907-36

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1907.....	7.1		7.1		7.1		7.1		7.1		7.1		7.1
1908.....	7.3		7.3		7.3		7.3		7.3		7.3		7.3
1909.....	7.3		7.3		7.3		7.3		7.3		7.3		7.3
1910.....	7.4		7.4		7.4		7.4		7.4		7.6		7.4
1911.....	7.6	7.6	7.6	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.8	7.8	7.3
1912.....	7.8	7.8	7.8	7.0	7.0	7.0	7.0	7.0	7.0	8.0	8.0	8.0	7.5
1913.....	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	9.0	8.8	8.8	8.8	8.3
1914.....	8.8	8.8	8.0	8.0	8.0	8.0	8.0	8.0	8.8	8.8	8.8	8.8	8.4
1915.....	8.8	8.7	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.1
1916.....	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	9.7	8.1
1917.....	9.5	9.5	9.5	10.0	10.0	10.0	11.0	11.0	11.0	13.2	13.0	13.0	10.9
1918.....	13.0	13.0	12.0	12.0	12.0	12.0	12.3	14.0	14.0	14.2	14.0	14.0	13.0
1919.....	14.0	14.0	14.0	13.0	13.2	13.2	14.0	15.0	16.0	16.0	16.0	16.0	14.5
1920.....	16.0	16.0	16.0	15.0	15.0	15.0	15.0	16.0	16.0	16.8	16.0	16.0	15.7
1921.....	16.0	15.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	12.3	10.0	13.4
1922.....	10.0	10.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	12.0	13.0	11.1
1923.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1924.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1925.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1926.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1927.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1928.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1929.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1930.....	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.9
1931.....	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0			11.7
1932.....													10.2
1933.....	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	10.1
1934.....	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
1935.....	11.0	11.0	12.0	11.5	12.0	12.0	12.0	12.1	11.1	10.1	10.6	11.4	11.4
1936.....	12.1	12.1	12.1	12.1	12.1	12.1	12.1	13.1	13.1	13.1	13.1	13.1	12.5

Compiled from reports of the Bureau of Labor Statistics.

TABLE 86.—*Retail prices per quart of milk delivered in Atlanta, Ga., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	9.0		9.3		9.3		9.7		9.7		9.7		9.4
1908	9.7		9.7		9.7		9.7		9.7		9.7		9.7
1909	9.7		9.7		9.7		9.7		9.7		9.7		9.7
1910	9.7		9.7		10.0		10.0		10.4		10.9		10.0
1911	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
1912	10.7	10.7	10.7	10.7	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.0	10.6
1913	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.6	10.6	10.8	10.2
1914	10.6	10.6	10.0	10.0	10.0	10.0	10.0	10.0	10.6	10.6	10.6	10.6	10.3
1915	10.6	10.6	10.6	10.6	10.6	10.0	10.0	10.0	10.0	10.0	10.7	10.7	10.4
1916	10.7	10.7	10.7	10.0	10.7	10.7	10.7	10.7	12.5	12.3	12.5	12.5	11.2
1917	12.3	12.3	13.2	13.2	14.1	13.9	13.5	13.3	15.0	15.9	17.5	17.7	14.3
1918	17.5	17.7	17.5	18.0	18.7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.1
1919	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	22.5	22.5	25.0	25.0	21.3
1920	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
1921	21.7	21.3	20.0	20.0	20.0	20.0	17.5	17.5	17.5	17.8	17.8	17.8	19.1
1922	17.8	17.5	16.7	16.7	15.7	15.7	15.7	15.7	16.7	16.7	16.7	16.7	16.4
1923	16.7	16.7	16.7	16.7	16.0	15.0	15.0	16.7	16.7	16.7	17.7	20.0	16.7
1924	19.3	19.3	17.7	17.7	17.7	17.7	16.0	16.0	16.0	19.0	17.5	17.5	17.6
1925	17.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	19.3	19.3	19.3	19.3	17.2
1926	19.3	19.3	20.0	20.0	20.0	20.0	20.0	18.8	18.8	19.0	19.0	19.0	19.4
1927	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.1
1928	18.0	18.0	18.0	18.0	18.0	16.5	16.5	16.5	16.5	16.5	16.5	16.5	17.1
1929	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	17.0	17.0	16.6
1930	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.2
1931	16.0	16.0	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.0	14.5		14.7
1932													13.3
1933	12.0	12.0	12.0	11.0	11.0	12.5	13.0	12.8	13.0	13.0	13.0	13.0	12.4
1934	10.7	10.8	10.8	11.2	11.8	11.8	12.0	12.0	13.0	13.5	14.0	13.8	12.1
1935	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
1936	14.0	14.0	14.0	13.9	13.9	13.9	14.0	15.0	15.0	15.0	15.0	15.0	14.4

Compiled from reports of the Bureau of Labor Statistics.

TABLE 87.—*Retail prices per quart of milk delivered in Omaha, Nebr., 1907-36*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	6.5		6.5		6.2		6.2		6.8		6.8		6.5
1908	6.8		6.8		6.6		6.6		6.8		6.8		6.8
1909	6.8		6.8		6.6		6.9		7.1		7.5		7.0
1910	7.8		7.8		7.6		7.6		8.0		8.0		7.8
1911	8.0	8.0	8.0	8.0	7.4	7.4	7.8	7.8	8.0	8.0	8.0	8.0	7.8
1912	8.0	8.0	8.0	8.0	8.0	7.5	7.4	7.4	7.3	7.4	7.7	7.7	7.7
1913	8.2	8.2	8.1	8.2	7.9	7.9	7.9	8.2	8.2	8.2	8.7	8.7	8.2
1914	8.7	8.7	8.7	8.4	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.4	8.4
1915	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
1916	8.4	8.4	8.4	8.5	8.4	8.4	8.4	8.5	8.9	8.9	8.9	8.9	8.6
1917	8.9	8.9	8.9	9.3	10.0	10.8	10.7	11.7	11.8	12.0	12.0	12.3	10.6
1918	12.3	12.3	12.3	12.5	12.5	12.7	12.5	13.3	13.8	14.8	14.8	14.7	13.2
1919	14.8	15.0	13.8	13.5	13.5	13.5	14.1	14.4	15.2	15.2	15.2	16.4	14.6
1920	15.9	15.9	15.9	15.9	15.9	15.5	15.5	15.5	15.5	15.5	15.5	15.1	15.6
1921	15.1	14.1	13.4	12.8	12.0	11.9	12.0	12.0	12.0	12.8	12.8	12.8	12.8
1922	11.7	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.1
1923	11.0	11.0	11.0	11.0	11.0	11.0	12.2	12.2	12.3	12.3	12.3	12.3	11.6
1924	12.2	12.2	12.2	12.2	11.3	11.0	11.5	11.5	11.5	11.5	12.1	12.1	11.8
1925	12.1	11.4	11.6	11.6	11.6	11.6	11.9	12.1	12.1	12.1	12.1	12.1	11.9
1926	11.6	11.4	11.1	11.1	10.3	10.3	10.8	11.3	11.3	11.3	11.3	11.3	11.1
1927	11.3	11.3	11.3	10.3	10.3	10.3	10.3	10.8	11.3	11.3	11.3	11.3	10.9
1928	11.3	11.0	10.3	10.3	10.3	10.3	11.3	11.3	11.3	11.3	11.3	11.3	10.9
1929	11.3	11.3	11.3	11.3	11.3	11.3	11.0	11.3	11.3	11.3	11.3	11.3	11.3
1930	11.3	11.3	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.1
1931	10.3	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0
1932													8.5
1933	7.0	7.0	7.0	8.0	8.0	8.0	9.0	9.0	9.0	9.0	9.0	9.0	8.3
1934	9.0	9.0	9.0	9.0	9.0	9.0	9.7	10.0	10.0	10.0	10.0	10.0	9.5
1935	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1936	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	10.4

Compiled from reports of the Bureau of Labor Statistics.

TABLE 88.—Retail prices per quart of milk delivered in Denver, Colo., 1907-86

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
1908	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.55	7.5	7.5	7.5
1909	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
1910	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
1911	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
1912	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.3	8.3	8.3	8.3	8.3	8.3
1913	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
1914	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
1915	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
1916	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.3	8.3
1917	8.3	8.3	8.3	8.7	8.8	9.8	9.8	10.3	11.5	11.6	12.0	12.0	10.0
1918	11.5	11.5	11.5	11.5	12.0	11.2	11.5	11.2	11.8	11.8	12.8	13.0	11.8
1919	12.6	12.6	12.6	12.6	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.7
1920	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.8	12.8	12.8	12.8	12.9
1921	12.8	12.8	12.8	11.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	11.4
1922	10.0	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	11.8	10.0
1923	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.7	11.7	11.7	11.7	11.7	11.8
1924	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.8	11.8	11.7
1925	11.8	12.0	10.5	10.5	10.5	10.5	12.0	12.0	12.0	12.0	12.0	12.0	11.4
1926	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1927	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1928	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1929	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
1930	12.0	11.0	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.4
1931	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
1932													10.1
1933	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1934	10.0	10.0	10.6	10.0	10.0	10.0	9.4	9.2	10.0	11.0	11.0	11.0	10.2
1935	11.0	11.0	11.0	11.0	11.0	11.0	10.7	10.7	10.7	10.9	10.7	10.5	10.8
1936	10.5	10.5	10.5	10.5	10.5	10.5	10.5	11.2	11.2	11.2	11.2	11.2	10.9

Compiled from reports of the Bureau of Labor Statistics.

TABLE 89.—Retail prices per quart of milk delivered in Los Angeles, Calif., 1907-86

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1907	9.7	9.7	9.7	9.0	9.0	9.0	9.0	9.0	9.0	9.7	9.7	9.3	9.3
1908	9.3	9.3	9.3	9.0	9.0	9.0	9.0	9.0	9.0	9.3	9.3	9.2	9.2
1909	9.3	9.3	9.3	9.0	9.0	9.0	9.0	9.0	9.0	9.3	9.3	9.2	9.2
1910	9.1	9.1	9.1	8.9	8.9	8.9	8.9	8.9	8.9	9.1	9.1	9.0	9.0
1911	9.1	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.5	9.5	9.5	10.0	9.4
1912	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1913	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1914	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1915	10.0	10.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.5
1916	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	9.0	9.0	9.0	8.3
1917	9.0	9.0	9.0	9.0	10.0	10.0	10.0	11.0	12.0	12.0	12.0	12.0	10.4
1918	14.0	14.0	14.0	14.0	13.0	13.0	14.0	14.0	14.0	14.0	14.0	14.0	13.8
1919	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	16.0	16.0	14.3
1920	16.0	16.0	16.0	16.0	16.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	17.0
1921	17.3	16.0	16.0	16.0	16.0	16.0	14.3	14.3	14.3	14.0	14.0	14.0	15.2
1922	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	15.0	15.0	14.2
1923	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1924	15.0	15.0	15.7	15.7	15.3	15.3	17.0	17.0	17.0	16.7	14.2	14.2	15.7
1925	14.1	15.0	15.3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1926	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1927	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1928	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1929	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1930	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5
1931	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0	12.6
1932													10.6
1933	11.0	11.0	11.0	9.0	8.3	9.7	9.7	12.0	12.0	12.0	11.5	11.2	10.7
1934	10.6	8.6	10.0	10.0	10.0	10.8	11.0	11.0	11.0	12.0	12.4	12.0	10.8
1935	12.0	12.0	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.2
1936	11.0	10.5	10.0	10.0	10.0	10.0	10.0	11.0	12.0	12.0	12.0	12.0	10.9

Compiled from reports of the Bureau of Labor Statistics.

TABLE 90.—*Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36*

[1913=100]

Year and month	Fluid milk per quart delivered	Meats	Eggs	Butter	Fruits and vegetables
1913	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
January.....	100.4	93	108.2	106.8	-----
February.....	100.3	94	91.3	107.7	-----
March.....	99.7	97	76.5	108.1	-----
April.....	99.5	101	73.1	105.6	-----
May.....	99.0	101	76.2	93.8	-----
June.....	98.9	101	80.8	91.8	-----
July.....	98.8	103	86.6	90.9	-----
August.....	99.1	104	95.6	92.4	-----
September.....	100.0	104	109.2	98.4	-----
October.....	101.1	103	120.1	99.9	-----
November.....	101.7	101	144.1	101.0	-----
December.....	101.8	99	138.1	103.6	-----
Average.....	100.0	100	100.0	100.0	-----
1914					
January.....	101.7	100	125.9	104.0	-----
February.....	101.7	101	105.9	93.5	-----
March.....	101.0	101	89.5	91.5	-----
April.....	100.3	102	74.0	85.9	-----
May.....	99.6	103	77.5	85.3	-----
June.....	99.5	103	81.6	87.6	-----
July.....	99.5	105	87.5	89.2	-----
August.....	99.9	110	96.3	94.2	-----
September.....	100.1	108	106.6	98.4	-----
October.....	100.7	105	113.1	98.2	-----
November.....	100.8	103	130.7	102.7	-----
December.....	100.9	99	138.6	102.5	-----
Average.....	100.5	103.4	102.3	94.4	-----
1915					
January.....	100.6	98	128.6	100.5	-----
February.....	100.1	96	97.9	98.4	-----
March.....	99.4	96	74.2	93.7	-----
April.....	98.9	98	75.4	93.9	-----
May.....	98.4	100	75.7	90.6	-----
June.....	98.4	101	77.8	90.3	-----
July.....	98.4	102	80.9	89.9	-----
August.....	98.6	102	88.4	87.6	-----
September.....	98.8	102	101.1	87.9	-----
October.....	99.5	103	116.9	91.6	-----
November.....	99.7	100	133.0	95.4	-----
December.....	99.6	97	134.8	100.8	-----
Average.....	99.2	99.6	98.7	93.4	-----
1916					
January.....	99.7	99	122.8	99.8	-----
February.....	99.7	100	101.0	99.3	-----
March.....	99.5	104	82.4	105.3	-----
April.....	99.2	107	79.1	107.9	-----
May.....	99.2	109	81.8	97.0	-----
June.....	99.2	112	86.9	95.1	-----
July.....	99.5	112	82.5	93.1	-----
August.....	101.2	112	105.2	95.4	-----
September.....	102.2	114	119.5	102.3	-----
October.....	105.4	112	132.3	108.7	-----
November.....	108.7	109	148.9	113.8	-----
December.....	111.9	108	153.5	117.8	-----
Average.....	102.2	108.2	108.8	103.0	-----
1917					
January.....	111.7	111.5	158.2	118.4	-----
February.....	112.1	118.1	147.0	122.3	-----
March.....	112.1	124.2	100.7	120.6	-----
April.....	114.0	134.7	112.1	133.2	-----
May.....	117.3	138.6	115.9	122.0	-----
June.....	119.0	140.3	119.1	122.9	-----
July.....	124.6	140.7	121.9	119.9	-----
August.....	128.0	142.8	133.5	124.4	-----
September.....	132.4	148.9	152.4	129.3	-----
October.....	142.6	151.9	169.9	133.0	-----
November.....	143.7	145.3	168.3	137.7	-----
December.....	147.1	146.5	184.0	141.9	-----
Average.....	125.4	137.0	139.4	127.2	-----

TABLE 90.—Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36—Continued

[1913=100]

Year and month	Fluid milk per quart delivered	Meats	Eggs	Butter	Fruits and vegetables
1918	Percent	Percent	Percent	Percent	Percent
January.....	150.6	149.8	195.4	148.0	-----
February.....	150.6	152.5	181.7	151.2	-----
March.....	150.6	152.3	128.4	144.1	-----
April.....	148.3	161.4	123.2	132.4	-----
May.....	148.3	172.0	122.9	133.2	-----
June.....	146.1	178.0	123.2	133.4	-----
July.....	148.3	179.1	142.3	137.3	-----
August.....	152.8	181.8	155.4	140.7	-----
September.....	160.7	188.2	169.9	154.6	-----
October.....	166.3	186.7	185.8	170.0	-----
November.....	173.0	184.4	214.8	174.4	-----
December.....	176.4	182.3	235.1	189.8	-----
Average.....	156.2	172.8	164.9	150.7	-----
1919					
January.....	175.3	184.5	218.0	184.1	-----
February.....	174.2	179.9	146.7	149.4	-----
March.....	171.9	182.3	140.0	173.6	-----
April.....	168.5	190.2	142.9	186.2	-----
May.....	167.4	193.6	153.9	177.3	-----
June.....	167.4	189.5	155.1	165.3	-----
July.....	168.5	192.9	164.1	164.0	-----
August.....	174.2	190.4	174.5	167.4	-----
September.....	176.4	184.5	183.2	171.5	-----
October.....	179.8	178.1	208.7	185.6	-----
November.....	184.3	173.1	234.8	196.9	-----
December.....	187.6	169.0	261.2	203.7	-----
Average.....	174.2	184.2	182.0	177.0	-----
1920					
January.....	186.5	172.9	239.7	193.7	-----
February.....	187.6	174.8	198.6	189.6	-----
March.....	186.5	177.1	161.2	196.3	-----
April.....	183.2	187.6	153.0	198.7	-----
May.....	182.0	187.8	153.3	187.0	-----
June.....	182.0	192.3	155.4	175.5	-----
July.....	187.6	198.2	166.1	177.3	-----
August.....	191.0	197.3	184.4	174.9	-----
September.....	193.3	200.2	206.1	179.1	-----
October.....	194.4	195.7	234.2	179.9	-----
November.....	194.4	186.1	249.6	181.2	-----
December.....	188.8	163.2	267.8	161.9	-----
Average.....	187.6	185.7	197.4	183.0	-----
1921					
January.....	183.2	167.0	229.3	159.3	-----
February.....	173.0	159.1	138.8	147.5	-----
March.....	170.8	162.0	120.9	150.4	-----
April.....	167.4	165.2	99.4	145.2	-----
May.....	161.8	162.1	96.8	111.0	-----
June.....	159.6	159.3	101.4	105.0	-----
July.....	157.3	159.6	122.6	121.7	-----
August.....	160.7	162.7	138.0	133.7	-----
September.....	158.4	159.2	146.1	132.1	-----
October.....	159.6	152.7	170.7	138.9	-----
November.....	160.7	144.7	201.4	138.6	-----
December.....	158.4	142.6	204.4	136.0	-----
Average.....	164.0	153.1	147.5	135.0	-----
1922					
January.....	152.8	141.5	144.6	118.3	-----
February.....	148.3	142.7	140.3	119.8	-----
March.....	146.1	147.9	92.2	119.6	-----
April.....	142.7	150.7	91.9	118.0	-----
May.....	140.4	153.9	97.1	117.2	-----
June.....	140.4	154.8	98.8	117.2	-----
July.....	143.8	155.9	104.4	119.3	-----
August.....	146.1	154.6	107.5	115.4	-----
September.....	147.2	153.9	129.9	121.9	-----
October.....	149.4	153.2	157.4	132.6	-----
November.....	150.6	148.2	187.0	142.6	-----
December.....	153.9	144.2	192.8	157.2	-----
Average.....	147.2	150.3	128.7	125.1	-----

TABLE 90.—*Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36—Continued*

[1913=100]

Year and month	Fluid milk per quart delivered	Meats	Eggs	Butter	Fruits and vegetables
1923	Percent	Percent	Percent	Percent	Percent
January.....	153.9	144.9	161.4	154.3	-----
February.....	153.9	144.5	133.9	150.7	-----
March.....	152.8	144.6	111.6	150.4	-----
April.....	152.8	145.8	99.7	149.6	-----
May.....	151.7	148.3	101.7	136.0	-----
June.....	151.7	150.4	102.6	130.6	-----
July.....	152.8	153.1	107.5	128.2	-----
August.....	153.9	153.5	120.3	135.3	-----
September.....	157.3	157.4	140.9	143.6	-----
October.....	158.4	153.7	158.3	146.7	-----
November.....	160.7	146.8	192.2	153.8	-----
December.....	160.7	144.1	188.1	157.4	-----
Average.....	155.1	149.0	134.8	144.7	-----
1924	Percent	Percent	Percent	Percent	Percent
January.....	159.6	146.2	158.3	160.1	-----
February.....	157.3	144.3	144.3	157.2	-----
March.....	156.2	145.6	100.9	151.4	-----
April.....	155.1	148.3	93.0	130.8	-----
May.....	152.8	151.3	95.1	120.4	-----
June.....	151.7	151.3	104.6	126.9	-----
July.....	151.7	150.7	114.2	129.2	-----
August.....	153.9	154.8	129.3	126.1	-----
September.....	156.2	155.4	150.4	126.6	-----
October.....	156.2	155.6	173.0	125.1	-----
November.....	155.1	149.8	197.4	127.7	-----
December.....	155.1	147.2	202.3	137.1	-----
Average.....	155.1	150.2	138.6	135.0	-----
1925	Percent	Percent	Percent	Percent	Percent
January.....	156.2	150.9	204.4	136.6	-----
February.....	156.2	150.6	154.8	132.1	-----
March.....	155.1	160.4	113.3	144.9	-----
April.....	155.1	163.9	110.4	139.2	-----
May.....	153.9	164.0	113.9	135.5	-----
June.....	153.9	163.8	122.6	137.6	-----
July.....	155.1	169.2	133.9	138.9	-----
August.....	156.2	169.3	141.7	141.3	-----
September.....	159.6	169.0	150.4	145.7	-----
October.....	160.7	167.6	174.8	155.1	-----
November.....	160.7	164.1	201.2	155.9	-----
December.....	160.7	162.9	191.9	153.0	-----
Average.....	157.3	163.0	151.0	143.1	-----
1926	Percent	Percent	Percent	Percent	Percent
January.....	159.6	165.7	156.2	144.6	-----
February.....	159.6	165.4	127.0	142.3	-----
March.....	157.3	166.6	111.6	139.9	-----
April.....	156.2	168.8	111.9	132.9	-----
May.....	156.2	172.3	112.8	130.5	-----
June.....	155.1	176.4	118.0	131.3	-----
July.....	155.1	176.3	122.0	130.8	-----
August.....	156.2	174.1	130.1	132.1	-----
September.....	157.3	175.7	149.3	137.1	-----
October.....	157.3	174.9	168.7	141.8	-----
November.....	158.4	170.7	191.3	145.4	-----
December.....	159.6	168.2	189.0	154.8	-----
Average.....	157.3	171.3	140.6	138.6	-----
1927	Percent	Percent	Percent	Percent	Percent
January.....	158.4	168.1	162.0	152.5	-----
February.....	158.4	167.6	128.1	153.5	-----
March.....	158.4	168.5	102.6	154.6	-----
April.....	157.3	170.6	98.3	152.5	-----
May.....	156.2	170.7	97.4	139.4	-----
June.....	156.2	168.3	97.1	135.2	-----
July.....	157.3	169.3	107.0	134.2	-----
August.....	158.4	171.0	121.7	134.2	-----
September.....	158.4	173.0	141.2	139.4	-----
October.....	159.6	173.7	164.1	145.4	-----
November.....	159.6	169.9	178.8	147.3	-----
December.....	160.7	168.1	172.8	152.5	-----
Average.....	158.4	169.9	131.0	145.2	-----

TABLE 90.—*Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36—Continued*

[1913=100]

Year and month	Fluid milk per quart delivered	Meats	Eggs	Butter	Fruits and vegetables
1928	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
January.....	160.7	168.3	162.0	150.9	-----
February.....	160.7	167.8	124.9	147.0	-----
March.....	159.6	167.1	107.2	149.6	-----
April.....	158.4	170.3	103.8	143.9	-----
May.....	158.4	175.4	108.7	142.6	-----
June.....	157.3	177.7	112.5	140.7	-----
July.....	158.4	184.4	120.6	141.8	-----
August.....	158.4	189.5	130.4	144.7	-----
September.....	159.6	195.8	146.1	150.4	-----
October.....	159.6	188.9	157.4	150.1	-----
November.....	160.7	184.9	171.9	152.2	-----
December.....	160.7	179.1	169.3	154.8	-----
Average.....	159.6	179.2	134.5	147.5	-----
1929					
January.....	160.7	180.9	146.7	150.7	-----
February.....	160.7	180.3	142.3	152.7	-----
March.....	160.7	182.8	122.0	152.5	-----
April.....	159.6	187.5	106.4	145.7	-----
May.....	159.6	191.2	112.2	142.3	-----
June.....	159.6	192.4	120.0	140.5	-----
July.....	160.7	195.9	127.8	139.4	-----
August.....	160.7	196.0	140.0	140.5	-----
September.....	160.7	194.2	153.6	143.1	-----
October.....	161.8	189.2	168.1	145.4	-----
November.....	161.8	184.1	183.5	139.7	-----
December.....	161.8	181.8	182.0	134.7	-----
Average.....	160.7	188.4	142.0	143.9	172.6
1930					
January.....	159.6	183.6	160.6	121.9	-----
February.....	158.4	183.1	136.8	122.7	-----
March.....	157.3	183.0	102.3	121.9	-----
April.....	157.3	183.3	100.0	125.6	-----
May.....	157.3	181.5	97.7	120.9	-----
June.....	157.3	179.9	97.4	113.1	-----
July.....	157.3	175.2	101.7	114.1	-----
August.....	157.3	169.9	112.5	123.8	-----
September.....	157.3	173.3	124.9	127.2	-----
October.....	157.3	171.1	129.9	124.8	-----
November.....	157.3	164.0	140.3	118.5	-----
December.....	151.7	161.6	120.6	111.0	-----
Average.....	157.3	175.8	118.8	120.4	179.9
1931					
January.....	149.4	159.5	104.6	98.4	-----
February.....	146.1	153.4	78.8	94.8	-----
March.....	144.9	152.5	82.6	97.4	-----
April.....	141.6	151.4	79.4	91.9	-----
May.....	138.2	149.3	71.9	81.5	-----
June.....	134.8	145.7	74.8	80.7	-----
July.....	136.0	147.8	82.9	82.8	-----
August.....	136.0	149.1	92.5	89.8	-----
September.....	136.0	147.7	98.0	96.1	-----
October.....	134.8	142.7	109.9	104.2	-----
November.....	134.8	135.4	115.1	97.7	-----
December.....	130.3	129.3	111.6	95.3	-----
Average.....	138.2	147.0	91.9	92.4	126.6
1932					
January.....	129.2	123.4	85.8	84.3	-----
February.....	128.1	117.3	70.1	77.0	-----
March.....	127.0	118.9	61.2	77.0	-----
April.....	123.6	118.6	58.0	70.0	-----
May.....	121.3	115.3	58.0	65.5	-----
June.....	121.3	113.4	60.3	62.9	-----
July.....	120.2	122.6	66.1	62.4	-----
August.....	118.0	120.1	77.7	70.0	-----
September.....	119.1	119.2	85.5	70.2	-----
October.....	120.2	114.6	100.3	69.7	-----
November.....	119.1	109.1	109.0	71.8	-----
December.....	116.9	103.2	115.7	77.8	-----
Average.....	122.5	116.0	78.8	71.5	106.6

TABLE 90.—*Indices of retail prices of fluid milk, meats, eggs, butter, and fruits and vegetables, by months, 1913-36—Continued*

[1913=100]

Year and month	Fluid milk per quart delivered	Meats	Eggs	Butter	Fruits and vegetables
	Percent	Percent	Percent	Percent	Percent
1933					
January.....	116.9	99.9	93.9	70.8	-----
February.....	115.7	99.0	62.0	64.8	-----
March.....	113.5	100.1	57.4	64.8	-----
April.....	113.5	98.8	53.3	66.3	-----
May.....	112.4	100.1	58.8	73.6	-----
June.....	114.6	103.7	58.0	73.4	-----
July.....	116.9	103.5	70.4	80.9	-----
August.....	123.0	106.3	74.5	72.0	-----
September.....	123.6	106.1	84.9	73.1	-----
October.....	124.7	106.8	95.0	73.8	-----
November.....	124.7	105.0	102.4	74.2	116.9
December.....	125.8	100.8	97.4	68.0	117.6
Average.....	119.1	102.7	75.7	71.3	116.6
1934					
January.....	124.7	108.0	87.3	67.0	129.4
February.....	127.5	107.2	78.0	79.9	136.2
March.....	124.7	109.4	71.4	81.8	135.2
April.....	124.7	111.6	68.8	75.8	130.4
May.....	124.7	115.1	67.6	77.3	132.0
June.....	125.2	117.0	70.0	78.8	125.6
July.....	126.2	120.2	76.9	79.0	118.9
August.....	127.6	125.2	91.6	85.8	117.0
September.....	129.8	132.8	100.7	85.1	115.8
October.....	130.9	127.4	106.2	84.4	109.6
November.....	131.5	121.6	115.0	90.6	104.8
December.....	131.5	120.0	111.4	92.0	103.5
Average.....	127.0	117.1	86.7	80.9	121.9
1935¹					
January.....	132.6	131.3	109.3	99.1	107.7
February.....	133.2	142.0	106.5	109.5	111.7
March.....	133.7	149.7	82.8	97.6	119.8
April.....	133.7	153.0	85.6	163.4	133.2
May.....	133.7	156.0	92.2	89.6	130.0
June.....	133.7	159.8	93.0	82.6	123.8
July.....	131.9	156.9	97.4	79.4	115.7
August.....	131.3	162.7	106.4	81.0	103.3
September.....	131.3	163.6	114.9	84.6	103.0
October.....	128.0	155.5	120.0	88.3	103.0
November.....	129.1	149.5	120.1	96.9	114.9
December.....	130.2	149.5	113.9	104.7	120.0
Average.....	131.3	² 152.5	² 103.5	93.0	115.5
1936					
January.....	130.3	149.8	104.4	106.8	122.8
February.....	131.5	146.1	99.9	111.5	121.4
March.....	130.3	143.7	89.4	102.9	120.8
April.....	130.3	144.9	80.9	98.2	130.2
May.....	130.3	143.5	84.3	90.4	137.2
June.....	130.3	144.8	89.2	93.5	166.7
July.....	130.3	146.1	95.9	104.0	157.9
August.....	134.8	146.9	106.3	111.0	145.0
September.....	137.1	150.0	111.1	110.7	139.2
October.....	137.1	145.8	118.4	105.0	131.4
November.....	137.1	143.5	127.5	103.4	129.8
December.....	137.1	143.2	121.6	104.4	135.3
Average.....	133.0	145.7	102.4	103.5	136.5

¹ Indices of eggs and meat from October to date calculated from 1923-25 base.² Straight average, 12 months.

Compiled from reports of the Bureau of Labor Statistics.

APPENDIX B--TYPICAL MEMBERSHIP CONTRACTS OF COOPERATIVE MILK PRODUCERS' ASSOCIATIONS

MICHIGAN MILK PRODUCERS' ASSOCIATION, INCORPORATED

406 Stephenson Building, Boulevard and Cass, Detroit, Mich.

Contract of _____ post-office address _____
County of _____ local _____

Whereas, the dairymen of the State of Michigan, have entered into an association in order to encourage better and more economical methods of milk production; to secure better results in marketing the dairy products of its members; and to perform any other work which may tend to the betterment of its members and the general benefit of the dairy industry.

This agreement, made this _____ day of _____ 193____, by and between Michigan Milk Producers' Association, Inc., party of the first part, hereinafter known as association, and _____ party of the second part, hereinafter known as producer.

Witnesseth: That for and in consideration of the benefits and advantages to our business, and in consideration of all the mutual undertakings and advantages to both parties hereto, the said parties have agreed and do hereby agree as follows:

1. The producer hereby agrees to affiliate with a local milk producers association in his vicinity and to pay the annual dues of said local association, as provided by the bylaws of the said local association.

2. That the producer hereby agrees to consign and does hereby consign to the association, as agent, for sale, all milk produced on the farm owned or controlled by the producer, as landlord, tenant or otherwise, except such milk as is required for home or farm consumption, for and during the term beginning on the date hereof and continuing to March 1, 193____, and thereafter for yearly periods, unless at least 10 days' notice in writing is given by either party before the expiration of any contract period of the desire to terminate such contract, at the end of the contract period.

3. The association agrees, as such agent of the producer, to sell and dispose of said milk consigned to it by the producer to the best advantage possible, and to guarantee the remittance of proceeds thereof, and, for the protection of its members, to remit the proceeds thereof to the producer less the commission hereinafter mentioned. It may, however, authorize the purchasers of milk from it, to pay direct to the producer all of the purchase money except the money due it as the commission hereinafter mentioned. Provided however, that if the said purchaser shall be authorized to pay direct to the producer herein, and in the course of the business shall fail to pay for said milk on the due date, then the producer shall notify the association of the purchaser's failure to pay within 5 days after such failure to pay, and in the event of the producer's failure to so notify the association of such failure to pay then this guarantee shall cease.

4. The producer agrees that it is now and will continue to be impractical and difficult to determine the actual damage resulting to the association should he fail to so deliver all of his milk so consigned herein, and in the event of his failure to so deliver said milk so consigned herein, the producer hereby assigns to the association, as liquidated damages, all amounts due the producer for milk at the time of the violation of this contract, due to the nondelivery of said milk.

5. The producer further agrees to deliver said milk, pure and unadulterated, in condition suitable for sale and subject to such rules and regulations of the municipality in which said milk is sold by the association; the milk to be delivered by the producer to such shipping stations, milk plants, or creameries as may be designated by the association.

6. It is further agreed that the association shall receive a commission from the proceeds of sale of 2 cents per 100 pounds on all milk sold during the term of this contract; 50 cents of which shall be applied each year as payment of subscription of party of the second part to the Michigan Milk Messenger: *Provided, however,* That should the association find its funds impaired through losses sustained by

guaranteeing payment of milk or should the association's functions be increased, then the association shall receive such other commissions as may be authorized by the delegates of the said association at duly called special or annual meetings of the said association, and the said commission shall be deducted from the proceeds of sale, and be paid to or received by the association therefor, and the association shall receive a proportionate commission for cream sold by it.

7. This agreement is one of a series generally similar in terms, comprising, with all such agreements, signed by individual producers or otherwise, one single contract between the association, and the said producers mutually and individually obligated under all the terms thereof and the signing of this contract shall be considered the signing of an application for membership to the association and an agreement to abide by all the rules and regulations thereof, and the violation of this agreement by the producer shall be considered full and sufficient cause for the cancellation of the producer's membership in the association.

8. The said producer agrees that in case he is offered a price for his dairy products in excess of the price obtained by the association, he will turn over said bid to the association to be filled from products promised to the association.

9. The producer further agrees to allow the association, or its properly appointed agent, to enter upon his premises and inspect his cows, stables, cooling rooms, and dairy equipment, and if the same are found to be insanitary, to correct the faulty conditions, and to submit all serious controversies as to weight and test of milk to the association for adjudication and settlement.

10. All other contracts in existence on this date between the parties hereto, are hereby canceled and held for naught.

This contract is executed in duplicate.

In witness whereof, the parties of these presents have hereunto set their hands and seals the day and year first above written.

MICHIGAN MILK PRODUCERS' ASSOCIATION, INC.

Signed, sealed, and delivered in the presence of:

-----		by	-----
Witness of first party.			
-----		and	-----
Witness of second party.			Party of second part—producer.
-----	-----	-----	-----
Company.	Station.		No.

Present purchaser of milk of second party.

NEW ENGLAND MILK PRODUCERS' ASSOCIATION—NEW ENGLAND DAIRIES, INC.

MEMBERSHIP AGREEMENT

Whereas, New England Milk Producers' Association, hereinafter called NEMPA, is an association of producers of dairy products duly organized under the laws of the Commonwealth of Massachusetts and having its usual place of business in Boston in said Commonwealth, and

Whereas, New England Dairies, Inc., hereinafter called Central Agency, is a cooperative association duly organized under the Cooperative Marketing Act of the State of Vermont, having its principal place of business in Barre in said State, both of said corporations having been organized for the purpose of minimizing speculation and waste in the marketing of dairy products and for the further purpose of performing services for producers of dairy products in connection with the production, marketing, selling, manufacture, and other utilization of milk and milk products, and

Whereas, the undersigned is a producer of dairy products and desires to avail himself of the services of the said associations for the marketing or other utilization thereof:

Therefore, in consideration of the mutual covenants herein contained, it is hereby agreed between said NEMPA on the one hand, and the producer, hereinafter called member, on the other hand as follows:

1. Member by the execution of this agreement by the parties hereto becomes a member of NEMPA and agrees to be bound by the bylaws, rules, and regulations of said NEMPA as the same may from time to time be in effect.

2. Member hereby appoints NEMPA as the sole and exclusive agent to sell or otherwise market all milk or cream owned and/or controlled by member during the period of this agreement except such as is retained for consumption on the premises where produced or is released by the NEMPA. Member grants to NEMPA full power and authority to sell such milk and cream in its own name to

such parties and at such prices, terms and conditions as NEMPA shall consider to be to the best advantage of member.

3. The member agrees that said milk or cream shall be delivered at such plants, shipping stations, or other places as NEMPA shall from time to time direct, it being agreed that said milk or cream shall be produced, kept and delivered under sanitary conditions in conformity with NEMPA requirements and the laws and board of health rules and regulations of the State and locality where such milk is produced and marketed.

4. The member hereby grants to NEMPA full power and authority to collect in its name all moneys due or to become due to the member for milk or milk products sold or to be sold by NEMPA. NEMPA may, at its own election, authorize the dealer to whom said milk or milk products are sold to remit in whole or in part directly to member. A copy of this agreement certified to by the clerk or other authorized agent of NEMPA shall constitute authority to the dealer to pay for products sold to said dealer as NEMPA may from time to time direct.

5. NEMPA agrees that it will sell said milk or cream, together with the milk or cream of other members, to such parties and at such prices, terms and conditions as it considers to be for the best advantage of the member and agrees that it will pay member the proceeds received from the sale of said milk or cream ratably, less costs of handling, operations, supervision, New England Dairyman, for which member hereby subscribes, and other costs and expenses of conducting the business and operations of NEMPA as determined by its board of directors, including such amounts as may be set aside as reserves. The board of directors of NEMPA shall have the right to establish equitable differentials with respect to grades, quality, quantity, location, and variation in amount of product delivered. NEMPA shall establish the greater Boston market district and such other market districts as it may deem necessary or advisable. With the consent of the sales committee of the market district where member's milk is sold, NEMPA shall have the right to blend proceeds received from sales for the member with proceeds received from sales for other members in the same district, and to distribute such blended proceeds, less charges as above specified, to member and other members in the same market district by a uniform method applicable to all said members; grades, quality, quantity, location, and variation in amount of product delivered, considered.

6. With the consent of the sales committee of each market district, NEMPA shall have the right to blend the proceeds received from sales for member with proceeds from sales for other members in other market districts and distribute such blended proceeds, less charges as above specified, to member and all other members in each market district by a uniform method applicable to all said members; grades, quality, quantity, location, and variation in amount of product delivered, considered.

7. *Property ownership under certain conditions.*—For the purpose of creating special funds to be used to build or otherwise acquire such plants and equipment, and to provide such working capital as NEMPA may deem necessary, NEMPA may, upon authorization of the Central Association at a regular or special meeting, due notice of this purpose having been included in the call for such meeting, withhold from the amounts due member hereunder such sums as NEMPA may deem necessary or advisable for such purposes. After the close of each fiscal year, each member shall receive a certificate in such form and on such terms and conditions as the board of directors of NEMPA may from time to time determine evidencing moneys contributed that year to said special funds.

8. NEMPA agrees that it will market the member's milk or milk products to or through the Central Agency, or such other agency as it may designate to act for it, so long as NEMPA is a member of Central Agency and Central Agency operates as a marketing agency for dairy products; and the member hereby specifically authorizes the NEMPA to withhold from the amounts otherwise due the member such amounts as may be necessary to pay to Central Agency member's proportion of the share of NEMPA in said Central Agency's obligations including amounts necessary for the purchase and/or liquidation of properties; and NEMPA is hereby expressly authorized to empower Central Agency to perform the marketing services through such agency or instrumentality as Central Agency may determine.

9. Inasmuch as the remedy at law would be inadequate and inasmuch as it is impracticable and extremely difficult to determine the actual damage resulting to NEMPA, should the member fail to deliver milk and cream in accordance with the terms hereof, regardless of the cause of such failure, member hereby agrees to pay to NEMPA for all milk and cream delivered or disposed of by or for him, other than in accordance with the terms hereof, the sum of 50 cents per hundred-

weight of milk or its equivalent as liquidated damages for the breach of this agreement; all parties agreeing that this agreement is one of a series dependent for its true value upon the adherence of each and all of the contracting parties to each and all of the said agreements, but the cancelation of this agreement or the failure of member to comply therewith shall not affect other similar agreements.

10. This agreement shall be continuous in its operation subject to any limitations imposed by law unless canceled and terminated on the 1st day of March in any calendar year upon written notice of intention to so cancel given by either party to the other between the 1st and 15th day of December next preceding.

11. This agreement shall supersede and terminate all contracts, agreements, or arrangements, heretofore made by member with respect to the sale of his milk or cream, subject however, to existing contracts with other parties which member hereby agrees not to renew and to terminate at the earliest possible date.

In witness whereof, parties hereto have executed this agreement this -----

day of ----- 193---

NEW ENGLAND MILK PRODUCERS' ASSOCIATION,

Member ----- by ----- *President.*

NEW ENGLAND DAIRIES, INC.,

Address ----- by ----- *President.*

Dealer ----- shipping station -----

APPENDIX C—EXTRACTS FROM AGRICULTURAL ADJUSTMENT ACT RELATIVE TO MILK ORDERS AND TEXT OF AGRICULTURAL MAR- KETING AGREEMENT ACT OF 1937

AGRICULTURAL ADJUSTMENT ACT, AS AMENDED, AT THE CLOSE
OF THE FIRST SESSION OF THE SEVENTY-FOURTH CONGRESS,
AUGUST 26, 1935.

An Act To relieve the existing national economic emergency by increasing agricultural purchasing power, to raise revenue for extraordinary expenses incurred by reason of such emergency, to provide emergency relief with respect to agricultural indebtedness, to provide for the orderly liquidation of joint-stock land banks, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—AGRICULTURAL ADJUSTMENT

DECLARATION OF EMERGENCY

That the present acute economic emergency being in part the consequence of a severe and increasing disparity between the prices of agricultural and other commodities, which disparity has largely destroyed the purchasing power of farmers for industrial products, has broken down the orderly exchange of commodities, and has seriously impaired the agricultural assets supporting the national credit structure, it is hereby declared that these conditions in the basic industry of agriculture have affected transactions in agricultural commodities with a national public interest, have burdened and obstructed the normal currents of commerce in such commodities, and render imperative the immediate enactment of title I of this act.

DECLARATION OF POLICY

SEC. 2. It is hereby declared to be the policy of Congress—

(1) Through the exercise of the powers conferred upon the Secretary of Agriculture under this title, to establish and maintain such balance between the production and consumption of agricultural commodities, and such marketing conditions therefore, as will reestablish prices to farmers at a level that will give agricultural commodities a purchasing power with respect to articles that farmers buy, equivalent to the purchasing power of agricultural commodities in the base period; and, in the case of all commodities for which the base period is the pre-war period, August 1909 to July 1914, will also reflect current interest payments per acre on farm indebtedness secured by real estate and tax payments per acre on farm real estate, as contrasted with such interest payments and tax payments during the base period. The base period in the case of all agricultural commodities except tobacco and potatoes shall be the pre-war period, August 1909–July 1914. In the case of tobacco and potatoes, the base period shall be the post-war period, August 1919–July 1929.

(2) To protect the interest of the consumer by (a) approaching the level of prices which it is declared to be the policy of Congress to establish in subsection (1) of this section by gradual correction of the current level at as rapid a rate as the Secretary of Agriculture deems to be in the public interest and feasible in view of the current consumptive demand in domestic and foreign markets, and (b) authorizing no action under this title which has for its purpose the maintenance of prices to farmers above the level which it is declared to be the policy of Congress to establish in subsection (1) of this section.⁸⁰

⁸⁰ Sec. 1 (b) of Public, No. 320, 74th Cong., approved Aug. 24, 1935, inserts the preceding subsec. "(2)" in lieu of subsecs. "(2)" and "(3)" of the original act, which read as follows:

"(2) To approach such equality of purchasing power by gradual correction of the present inequalities therein at as rapid a rate as is deemed feasible in view of the current consumptive demand in domestic and foreign markets.

"(3) To protect the consumers' interest by readjusting farm production at such level as will not increase the percentage of the consumers' retail expenditures for agricultural commodities, or products derived therefrom, which is returned to the farmer, above the percentage which was returned to the farmer in the pre-war period, August 1909–July 1914."

ORDERS

SEC. 8c. (1) The Secretary of Agriculture shall, subject to the provisions of this section, issue, and from time to time amend, orders applicable to processors, associations of producers, and others engaged in the handling of any agricultural commodity or product thereof specified in subsection (2) of this section. Such persons are referred to in this title as "handlers." Such orders shall regulate, in the manner hereinafter in this section provided, only such handling of such agricultural commodity, or product thereof, as is in the current of interstate or foreign commerce, or which directly burdens, obstructs, or affects, interstate or foreign commerce in such commodity or product thereof.⁸¹

COMMODITIES TO WHICH APPLICABLE

(2) Orders issued pursuant to this section shall be applicable only to the following agricultural commodities and the products thereof (except products of naval stores), or to any regional, or market classification of any such commodity or product: Milk, fruits (including pecans and walnuts but not including apples and not including fruits, other than olives, for canning), tobacco, vegetables (not including vegetables, other than asparagus, for canning), soybeans and naval stores as included in the Naval Stores Act and standards established thereunder (including refined or partially refined oleoresin).

NOTICE AND HEARING

(3) Whenever the Secretary of Agriculture has reason to believe that the issuance of an order will tend to effectuate the declared policy of this title with respect to any commodity or product thereof specified in subsection (2) of this section, he shall give due notice of and an opportunity for a hearing upon a proposed order.

FINDING AND ISSUANCE OF ORDER

(4) After such notice and opportunity for hearing, the Secretary of Agriculture shall issue an order if he finds, and sets forth in such order, upon the evidence introduced at such hearing (in addition to such other findings as may be specifically required by this section) that the issuance of such order and all of the terms and conditions thereof will tend to effectuate the declared policy of this title with respect to such commodity.

TERMS—MILK AND ITS PRODUCTS

(5) In the case of milk and its products, orders issued pursuant to this section shall contain one or more of the following terms and conditions, and (except as provided in subsection (7)) no others:

(A) Classifying milk in accordance with the form in which or the purpose for which it is used, and fixing, or providing a method for fixing, minimum prices for each such use classification which all handlers shall pay, and the time when payments shall be made, for milk purchased from producers or associations of producers. Such prices shall be uniform as to all handlers, subject only to adjustments for (1) volume, market, and production differentials customarily applied by the handlers subject to such order, (2) the grade or quality of the milk purchased, and (3) the locations at which delivery of such milk, or any use classification thereof, is made to such handlers.

(B) Providing: (i) For the payment to all producers and associations of producers delivering milk to the same handler of uniform prices for all milk delivered by them: *Provided*, That, except in the case of orders covering milk products only, such provision is approved or favored by at least three-fourths of the producers who, during a representative period determined by the Secretary of Agriculture, have been engaged in the production for market of milk covered in such order or by producers who, during such representative period, have produced at least three-fourths of the volume of such milk produced for market during such period; the approval required hereunder shall be separate and apart from any other approval or disapproval provided for by this section; or

(ii) for the payment to all producers and associations of producers delivering milk to all handlers of uniform prices for all milk so delivered, irrespective of the uses made of such milk by the individual handler to whom it is delivered; subject, in either case, only to adjustments for (a) volume, market, and production differentials customarily applied by the handlers subject to such order, (b) the grade

⁸¹ Section 8c was added by sec. 5 of Public, No. 320, 74th Cong., approved Aug. 24, 1935.

or quality of the milk delivered, (c) the locations at which delivery of such milk is made, and (d) a further adjustment, equitably to apportion the total value of the milk purchased by any handler, or by all handlers, among producers and associations of producers, on the basis of their production of milk during a representative period of time.

(C) In order to accomplish the purposes set forth in paragraphs (A) and (B) of this subsection (5), providing a method for making adjustments in payments, as among handlers (including producers who are also handlers), to the end that the total sums paid by each handler shall equal the value of the milk purchased by him at the prices fixed in accordance with paragraph (A) hereof.

(D) Providing that, in the case of all milk purchased by handlers from any producer who did not regularly sell milk during a period of 30 days next preceding the effective date of such order for consumption in the area covered thereby, payments to such producer, for the period beginning with the first regular delivery by such producer and continuing until the end of two full calendar months following the first day of the next succeeding calendar month, shall be made at the price for the lowest use classification specified in such order, subject to the adjustments specified in paragraph (B) of this subsection (5).

(E) Providing (i) except as to producers for whom such services are being rendered by a cooperative marketing association, qualified as provided in paragraph (F) of this subsection (5), for market information to producers and for the verification of weights, sampling, and testing of milk purchased from producers, and for making appropriate deductions therefor from payments to producers, and (ii) for assurance of, and security for, the payment by handlers for milk purchased.

(F) Nothing contained in this subsection (5) is intended or shall be construed to prevent a cooperative marketing association qualified under the provisions of the Act of Congress of February 18, 1922, as amended, known as the "Capper-Volstead Act", engaged in making collective sales or marketing of milk or its products for the producers thereof, from blending the net proceeds of all of its sales in all markets in all use classifications, and making distribution thereof to its producers in accordance with the contract between the association and its producers: *Provided*, That it shall not sell milk or its products to any handler for use or consumption in any market at prices less than the prices fixed pursuant to paragraph (A) of this subsection (5) for such milk.

(G) No marketing agreement or order applicable to milk and its products in any marketing area shall prohibit or in any manner limit, in the case of the products of milk, the marketing in that area of any milk or product thereof produced in any production area in the United States.

* * * * *

TERMS COMMON TO ALL ORDERS

(7) In the case of the agricultural commodities and the products thereof specified in subsection (2), orders shall contain one or more of the following terms and conditions:

(A) Prohibiting unfair methods of competition and unfair trade practices in the handling thereof.

(B) Providing that (except for milk and cream to be sold for consumption in fluid form) such commodity or product thereof, or any grade, size, or quality thereof shall be sold by the handlers thereof, only at prices filed by such handlers in the manner provided in such order.

(C) Providing for the selection by the Secretary of Agriculture, or a method for the section, of an agency or agencies and defining their powers and duties, which shall include only the powers:

(i) To administer such order in accordance with its terms and provisions;

(ii) To make rules and regulations to effectuate the terms and provisions of such order;

(iii) To receive, investigate, and report to the Secretary of Agriculture complaints of violations of such order; and

(iv) To recommend to the Secretary of Agriculture amendments to such order.

No person acting as a member of an agency established pursuant to this paragraph (C) shall be deemed to be acting in an official capacity, within the meaning of section 10 (g) of this title, unless such person receives compensation for his personal services from funds of the United States.

(D) Incidental to, and not inconsistent with, the terms and conditions specified in subsections (5), (6), and (7) and necessary to effectuate the other provisions of such order.

ORDERS WITH MARKETING AGREEMENT

(8) Except as provided in subsection (9) of this section, no order issued pursuant to this section shall become effective until the handlers (excluding cooperative associations of producers who are not engaged in processing, distributing, or shipping the commodity or product thereof covered by such order) of not less than 50 per centum of the volume of the commodity or product thereof covered by such order which is produced or marketed within the production or marketing area defined in such order have signed a marketing agreement, entered into pursuant to section 8b of this title, which regulates the handling of such commodity or product in the same manner as such order, except that as to citrus fruits produced in any area producing what is known as California citrus fruits no order issued pursuant to this subsection (8) shall become effective until the handlers of not less than 80 per centum of the volume of such commodity or product thereof covered by such order have signed such a marketing agreement: *Provided*, That no order issued pursuant to this subsection shall be effective unless the Secretary of Agriculture determines that the issuance of such order is approved or favored:

(A) By at least two-thirds of the producers who (except that as to citrus fruits produced in any area producing what is known as California citrus fruits said order must be approved or favored by three-fourths of the producers), during a representative period determined by the Secretary, have been engaged, within the production area specified in such marketing agreement or order, in the production for market of the commodity specified therein, or who, during such representative period, have been engaged in the production of such commodity for sale, in the marketing area specified in such marketing agreement, or order, or

(B) By producers who, during such representative period, have produced for market at least two-thirds of the volume of such commodity produced for market within the production area specified in such marketing agreement or order, or who, during such representative period, have produced at least two-thirds of the volume of such commodity sold within the marketing area specified in such marketing agreement or order.

ORDERS WITH OR WITHOUT MARKETING AGREEMENT

(9) Any order issued pursuant to this section shall become effective in the event that, notwithstanding the refusal or failure of handlers (excluding cooperative associations of producers who are not engaged in processing, distributing, or shipping the commodity or product thereof covered by such order) of more than 50 per centum of the volume of the commodity or product thereof (except that as to citrus fruits produced in any area producing what is known as California citrus fruits said per centum shall be 80 per centum) covered by such order which is produced or marketed within the production or marketing area defined in such order to sign a marketing agreement relating to such commodity or product thereof, on which a hearing has been held, the Secretary of Agriculture, with the approval of the President, determines:

(A) That the refusal or failure to sign a marketing agreement (upon which a hearing has been held) by the handlers (excluding cooperative associations of producers who are not engaged in processing, distributing, or shipping the commodity or product thereof covered by such order) of more than 50 per centum of the volume of the commodity or product thereof (except that as to citrus fruits produced in any area producing what is known as California citrus fruits said per centum shall be 80 per centum) specified therein which is produced or marketed within the production or marketing area specified therein tends to prevent the effectuation of the declared policy of this title with respect to such commodity or product, and

(B) That the issuance of such order is the only practical means of advancing the interests of the producers of such commodity pursuant to the declared policy, and is approved or favored:

(i) By at least two-thirds of the producers (except that as to citrus fruits produced in any area producing what is known as California citrus fruits said order must be approved or favored by three-fourths of the producers) who, during a representative period determined by the Secretary, have been engaged, within the production area specified in such marketing agreement or order, in the production for market of the commodity specified therein, or who, during such representative period, have been engaged in the production of such commodity for sale in the marketing area specified in such marketing agreement, or order, or

(ii) By producers who, during such representative period, have produced for market at least two-thirds of the volume of such commodity produced for market

within the production area specified in such marketing agreement or order, or who, during such representative period, have produced at least two-thirds of the volume of such commodity sold within the marketing area specified in such marketing agreement or order.

MANNER OF REGULATION AND APPLICABILITY

(10) No order shall be issued under this section unless it regulates the handling of the commodity or product covered thereby in the same manner as, and is made applicable only to persons in the respective classes of industrial or commercial activity specified in, a marketing agreement upon which a hearing has been held. No order shall be issued under this title prohibiting, regulating, or restricting the advertising of any commodity or product covered thereby, nor shall any marketing agreement contain any provision prohibiting, regulating, or restricting the advertising of any commodity or product covered by such marketing agreement.

REGIONAL APPLICATION

(11) (A) No order shall be issued under this section which is applicable to all production areas or marketing areas, or both, of any commodity or product thereof unless the Secretary finds that the issuance of several orders applicable to the respective regional production areas or regional marketing areas, or both, as the case may be, of the commodity or product would not effectively carry out the declared policy of this title.

(B) Except in the case of milk and its products, orders issued under this section shall be limited in their application to the smallest regional production areas or regional marketing areas, or both, as the case may be, which the Secretary finds practicable, consistently with carrying out such declared policy.

(C) All orders issued under this section which are applicable to the same commodity or product thereof shall, so far as practicable, prescribe such different terms, applicable to different production areas and marketing areas, as the Secretary finds necessary to give due recognition to the differences in production and marketing of such commodity or product in such areas.

COOPERATIVE ASSOCIATION REPRESENTATION

(12) Whenever, pursuant to the provisions of this section, the Secretary is required to determine the approval or disapproval of producers with respect to the issuance of any order, or any term or condition thereof, or the termination thereof, the Secretary shall consider the approval or disapproval by any cooperative association of producers, bona fide engaged in marketing the commodity or product thereof covered by such order, or in rendering services for or advancing the interests of the producers of such commodity, as the approval or disapproval of the producers who are members of, stockholders in, or under contract with, such cooperative association of producers.

RETAILER AND PRODUCER EXEMPTION

(13) (A) No order issued under subsection (9) of this section shall be applicable to any person who sells agricultural commodities or products thereof at retail in his capacity as such retailer, except to a retailer in his capacity as a retailer of milk and its products.

(B) No order issued under this title shall be applicable to any producer in his capacity as a producer.

VIOLATION OF ORDER

(14) Any handler subject to an order issued under this section, or any officer, director, agent, or employee of such handler, who violates any provision of such order (other than a provision calling for payment of a pro rata share of expenses) shall, on conviction, be fined not less than \$50 or more than \$500 for each such violation, and each day during which such violation continues shall be deemed a separate violation: *Provided*, That if the court finds that a petition pursuant to subsection (15) of this section was filed and prosecuted by the defendant in good faith and not for delay, no penalty shall be imposed under this subsection for such violations as occurred between the date upon which the defendant's petition was filed with the Secretary, and the date upon which notice of the Secretary's ruling thereon was given to the defendant in accordance with regulations prescribed pursuant to subsection (15).

PETITION BY HANDLER AND REVIEW

(15) (A) Any handler subject to an order may file a written petition with the Secretary of Agriculture, stating that any such order or any provision of any such order or any obligation imposed in connection therewith is not in accordance with law and praying for a modification thereof or to be exempted therefrom. He shall thereupon be given an opportunity for a hearing upon such petition, in accordance with regulations made by the Secretary of Agriculture, with the approval of the President. After such hearing, the Secretary shall make a ruling upon the prayer of such petition which shall be final, if in accordance with law.

(B) The District Courts of the United States (including the Supreme Court of the District of Columbia) in any district in which such handler is an inhabitant, or has his principal place of business, are hereby vested with jurisdiction in equity to review such ruling, provided a bill in equity for that purpose is filed within twenty days from the date of the entry of such ruling. Service of process in such proceedings may be had upon the Secretary by delivering to him a copy of the bill of complaint. If the court determines that such ruling is not in accordance with law, it shall remand such proceedings to the Secretary with directions either (1) to make such ruling as the court shall determine to be in accordance with law, or (2) to take such further proceedings as, in its opinion, the law requires. The pendency of proceedings instituted pursuant to this subsection (15) shall not impede, hinder, or delay the United States or the Secretary of Agriculture from obtaining relief pursuant to section 8a (6) of this title. Any proceedings brought pursuant to section 8a (6) of this title (except where brought by way of counterclaim in proceedings instituted pursuant to this subsection (15)) shall abate whenever a final decree has been rendered in proceedings between the same parties, and covering the same subject matter, instituted pursuant to this subsection (15).

TERMINATION OF ORDERS AND MARKETING AGREEMENTS

(16) (A) The Secretary of Agriculture shall, whenever he finds that any order issued under this section, or any provision thereof, obstructs or does not tend to effectuate the declared policy of this title, terminate or suspend the operation of such order or such provision thereof.

(B) The Secretary shall terminate any marketing agreement entered into under section 8b, or order issued under this section, at the end of the then current marketing period for such commodity, specified in such marketing agreement or order, whenever he finds that such termination is favored by a majority of the producers who, during a representative period determined by the Secretary, have been engaged in the production for market of the commodity specified in such marketing agreement or order, within the production area specified in such marketing agreement or order, or who, during such representative period, have been engaged in the production of such commodity for sale within the marketing area specified in such marketing agreement or order: *Provided*, That such majority have, during such representative period, produced for market more than 50 per centum of the volume of such commodity produced for market within the production area specified in such marketing agreement or order, or have, during such representative period, produced more than 50 per centum of the volume of such commodity sold in the marketing area specified in such marketing agreement or order, but such termination shall be effective only if announced on or before such date (prior to the end of the then current marketing period) as may be specified in such marketing agreement or order.

(C) The termination or suspension of any order or amendment thereto or provision thereof, shall not be considered an order within the meaning of this section.

PROVISIONS APPLICABLE TO AMENDMENTS

(17) The provisions of this section, section 8d, and section 8e applicable to orders shall be applicable to amendments to orders: *Provided*, That notice of a hearing upon a proposed amendment to any order issued pursuant to section 8c, given not less than three days prior to the date fixed for such hearing, shall be deemed due notice thereof.

BOOKS AND RECORDS

SEC. 8d. (1) All parties to any marketing agreement, and all handlers subject to an order, shall severally, from time to time, upon the request of the Secretary, furnish him with such information as he finds to be necessary to enable him to ascertain and determine the extent to which such agreement or order has been

carried out or has effectuated the declared policy of this title, and with such information as he finds to be necessary to determine whether or not there has been any abuse of the privilege of exemptions from the antitrust laws. Such information shall be furnished in accordance with forms of reports to be prescribed by the Secretary. For the purpose of ascertaining the correctness of any report made to the Secretary pursuant to this subsection, or for the purpose of obtaining the information required in any such report, where it has been requested and has not been furnished, the Secretary is hereby authorized to examine such books, papers, records, copies of income-tax reports, accounts, correspondence, contracts, documents, or memoranda, as he deems relevant and which are within the control (1) of any such party to such marketing agreement, or any such handler, from whom such report was requested or (2) of any person having, either directly or indirectly, actual or legal control of or over such party or such handler or (3) of any subsidiary of any such party, handler, or person.

(2) Notwithstanding the provisions of section (7), all information furnished to or acquired by the Secretary of Agriculture pursuant to this section shall be kept confidential by all officers and employees of the Department of Agriculture and only such information so furnished or acquired as the Secretary deems relevant shall be disclosed by them, and then only in a suit or administrative hearing brought at the direction, or upon the request, of the Secretary of Agriculture, or to which he or any officer of the United States is a party, and involving the marketing agreement or order with reference to which the information so to be disclosed was furnished or acquired. Nothing in this section shall be deemed to prohibit (A) the issuance of general statements based upon the reports of a number of parties to a marketing agreement or of handlers subject to an order, which statements do not identify the information furnished by any person, or (B) the publication by direction of the Secretary, of the name of any person violating any marketing agreement or any order, together with a statement of the particular provisions of the marketing agreement or order violated by such person. Any such officer or employee violating the provisions of this section shall upon conviction be subject to a fine of not more than \$1,000 or to imprisonment for not more than one year, or to both, and shall be removed from office.⁸²

DETERMINATION OF BASE PERIOD

SEC. 8e. In connection with the making of any marketing agreement or the issuance of any order, if the Secretary finds and proclaims that, as to any commodity specified in such marketing agreement or order, the purchasing power during the base period specified for such commodity in section 2 of this title cannot be satisfactorily determined from available statistics of the Department of Agriculture, the base period, for the purposes of such marketing agreement or order, shall be the post-war period, August 1919–July 1929, or all that portion thereof for which the Secretary finds and proclaims that the purchasing power of such commodity can be satisfactorily determined from available statistics of the Department of Agriculture.⁸³

AGRICULTURAL MARKETING AGREEMENT ACT OF 1937

An Act To reenact and amend provisions of the Agricultural Adjustment Act, as amended, relating to marketing agreements and orders.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following provisions of the Agricultural Adjustment Act, as amended, not having been intended for the control of the production of agricultural commodities, and having been intended to be effective irrespective of the validity of any other provision of that Act are expressly affirmed and validated, and are reenacted without change except as provided in section 2:

- (a) Section 1 (relating to the declaration of emergency);
- (b) Section 2 (relating to declaration of policy);
- (c) Section 8a (5), (6), (7), (8), and (9) (relating to violations and enforcement);
- (d) Section 8b (relating to marketing agreements);
- (e) Section 8c (relating to orders);
- (f) Section 8d (relating to books and records);
- (g) Section 8e (relating to determination of base period);

⁸² Section 8d was added by sec. 6 of Public, No. 320, 74th Cong., approved Aug. 24, 1935. The section in the original act re the furnishing of reports was "sec. 8 (4)", which was repealed by said sec. 6 of Public, No. 320. It read as follows:

"(4) To require any licensee under this section to furnish such reports as to quantities of agricultural commodities or products thereof bought and sold and the prices thereof, and as to trade practices and charges, and to keep such systems of accounts, as may be necessary for the purpose of part 2 of this title."

⁸³ Section 8e was added by sec. 6 of Public, No. 320, 74th Cong., approved Aug. 24, 1935.

- (h) Section 10 (a), (b) (2), (c), (f), (g), (h), and (i) (miscellaneous provisions);
- (i) Section 12 (a) and (c) (relating to appropriation and expenses);
- (j) Section 14 (relating to separability);
- (k) Section 22 (relating to imports).

SEC. 2. The following provisions, reenacted in section 1 of this Act, are amended as follows:

- (a) Section 1 is amended to read as follows:

"DECLARATION

"It is hereby declared that the disruption of the orderly exchange of commodities in interstate commerce impairs the purchasing power of farmers and destroys the value of agricultural assets which support the national credit structure and that these conditions affect transactions in agricultural commodities with a national public interest, and burden and obstruct the normal channels of interstate commerce."

(b) Section 2 (1) is amended by striking out "balance between the production and consumption of agricultural commodities, and such marketing conditions therefor, as will reestablish" and inserting in lieu thereof the following: "orderly marketing conditions for agricultural commodities in interstate commerce as will establish".

(c) Section 8a (6) is amended by striking out ", the provisions of this section, or of".

(d) Section 8c (5) (B) (d) is amended by striking out "production" and inserting in lieu thereof "marketings".

(e) Section 8c (6) (B) is amended by striking out "produced or"; and by striking out "production or sales of" and inserting in lieu thereof "quantities available for sale by".

- (f) Section 8c is amended by adding at the end thereof the following:

"MILK PRICES

"(18) The Secretary of Agriculture, prior to prescribing any term in any marketing agreement or order, or amendment thereto, relating to milk or its products, if such term is to fix minimum prices to be paid to producers or associations of producers, or prior to modifying the price fixed in any such term, shall ascertain, in accordance with section 2 and section 8e, the prices that will give such commodities a purchasing power equivalent to their purchasing power during the base period. The level of prices which it is declared to be the policy of Congress to establish in section 2 and section 8e shall, for the purposes of such agreement, order, or amendment, be such level as will reflect the price of feeds, the available supplies of feeds, and other economic conditions which affect market supply and demand, for milk or its products in the marketing area to which the contemplated marketing agreement, order, or amendment relates. Whenever the Secretary finds, upon the basis of the evidence adduced at the hearing required by section 8b or 8c, as the case may be, that the prices that will give such commodities a purchasing power equivalent to their purchasing power during the base period as determined pursuant to section 2 and section 8e are not reasonable in view of the price of feeds, the available supplies of feeds, and other economic conditions which affect market supply and demand for milk and its products in the marketing area to which the contemplated agreement, order, or amendment relates, he shall fix such prices as he finds will reflect such factors, insure a sufficient quantity of pure and wholesome milk, and be in the public interest. Thereafter, as the Secretary finds necessary on account of changed circumstances, he shall, after due notice and opportunity for hearing, make adjustments in such prices.

"PRODUCER REFERENDUM

"(19) For the purpose of ascertaining whether the issuance of an order is approved or favored by producers, as required under the applicable provisions of this title, the Secretary may conduct a referendum among producers. The requirements of approval or favor under any such provision shall be held to be complied with if, of the total number of producers, or the total volume of production, as the case may be, represented in such referendum, the percentage approving or favoring is equal to or in excess of the percentage required under such provision. Nothing in this subsection shall be construed as limiting representation by cooperative associations as provided in subsection (12)."

(g) Section 10 (c) is amended by striking out "including regulations establishing conversion factors for any commodity and article processed therefrom to determine the amount of tax imposed or refunds to be made with respect thereto".

(h) Section 10 (f) is amended by striking out the last sentence thereof.

(i) Section 10 is amended by adding at the end thereof the following new subsection:

“(j) The term ‘interstate or foreign commerce’ means commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory, or possession, or the District of Columbia, but through any place outside thereof; or within any Territory or possession, or the District of Columbia. For the purpose of this Act (but in nowise limiting the foregoing definition) a marketing transaction in respect to an agricultural commodity or the product thereof shall be considered in interstate or foreign commerce if such commodity or product is part of that current of interstate or foreign commerce usual in the handling of the commodity or product whereby they, or either of them, are sent from one State to end their transit, after purchase, in another, including all cases where purchase or sale is either for shipment to another State or for the processing within the State and the shipment outside the State of the products so processed. Agricultural commodities or products thereof normally in such current of interstate or foreign commerce shall not be considered out of such current through resort being had to any means or device intended to remove transactions in respect thereto from the provisions of this Act. As used herein, the word ‘State’ includes Territory, the District of Columbia, possession of the United States, and foreign nations.”

(j) Section 12 (a) is amended by striking out “and production adjustments”.

SEC. 3. (a) The Secretary of Agriculture, or such officer or employee of the Department of Agriculture as may be designated by him, upon written application of any cooperative association, incorporated or otherwise, which is in good faith owned or controlled by producers or organizations thereof, of milk or its products, and which is bona fide engaged in collective processing or preparing for market or handling or marketing (in the current of interstate or foreign commerce, as defined by paragraph (i) of section 2 of this Act), milk or its products, may mediate and, with the consent of all parties, shall arbitrate if the Secretary has reason to believe that the declared policy of the Agricultural Adjustment Act, as amended, would be effectuated thereby, bona fide disputes, between such associations and the purchasers or handlers or processors or distributors of milk or its products, as to terms and conditions of the sale of milk or its products. The power to arbitrate under this section shall apply only to such subjects of the term or condition in dispute as could be regulated under the provisions of the Agricultural Adjustment Act, as amended, relating to orders for milk and its products.

(b) Meetings held pursuant to this section shall be conducted subject to such rules and regulations as the Secretary may prescribe.

(c) No award or agreement resulting from any such arbitration or mediation shall be effective unless and until approved by the Secretary of Agriculture, or such officer or employee of the Department of Agriculture as may be designated by him, and shall not be approved if it permits any unlawful trade practice or any unfair method of competition.

(d) No meeting so held and no award or agreement so approved shall be deemed to be in violation of any of the antitrust laws of the United States.

SEC. 4. Nothing in this Act shall be construed as invalidating any marketing agreement, license, or order, or any regulation relating to, or any provision of, or any act of the Secretary of Agriculture in connection with, any such agreement, license, or order which has been executed, issued, approved, or done under the Agricultural Adjustment Act, or any amendment thereof, but such marketing agreements, licenses, orders, regulations, provisions, and acts are hereby expressly ratified, legalized, and confirmed.

SEC. 5. No processing taxes or compensating taxes shall be levied or collected under the Agricultural Adjustment Act, as amended. Except as provided in the preceding sentence, nothing in this Act shall be construed as affecting provisions of the Agricultural Adjustment Act, as amended, other than those enumerated in section 1. The provisions so enumerated shall apply in accordance with their terms (as amended by this Act) to the provisions of the Agricultural Adjustment Act, this Act, and other provisions of law to which they have been heretofore made applicable.

SEC. 6. This Act may be cited as the “Agricultural Marketing Agreement Act of 1937”.

Approved, June 3, 1937.

